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DEPARTMENT OF COMMERCE
BUREAU OF CORPORATIONS
JOSEPH E. DAVIES, Commissioner

CONDITIONS

IN THE

HEALDTON OIL FIELD

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CONDITIONS

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LETTERS OF TRANSMITTAL.

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, March 15, 1915.

SIR: I transmit herewith a report of the Commissioner of Corporations on Conditions in the Healdton Oil Field made in response to a resolution of the Senate of March 28, 1914.

Very respectfully,

WILLIAM C. REDFIELD,
Secretary.

The PRESIDENT.

DEPARTMENT OF COMMERCE,
BUREAU OF CORPORATIONS,
Washington, March 15, 1915.

SIR: I have the honor to transmit herewith a report on Conditions in the Healdton Oil Field, prepared at your direction in response to a resolution of the Senate of March 28, 1914, and submitted to the President in accordance with the law creating the Bureau of Corporations.

I desire to mention as especially contributing under my direction to the preparation of this report Messrs. David L. Wing and Timothy A. Carroll, of this Bureau.

Very respectfully,

JOSEPH E. DAVIES,
Commissioner of Corporations.

To Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF CORPORATIONS,
Washington March 15, 1915.

SIR: I have the honor to submit herewith a report dealing with the conditions in the Healdton, Okla., oil field (sometimes called the Ardmore oil field).

This report is made pursuant to a resolution passed by the Senate on March 28, 1914, which directed an inquiry into the cause of a reduction made shortly before that time in the price of crude oil in the "Ardmore" oil field on the part of the Magnolia Pipe Line Co., whether corresponding changes had been made in the prices of the finished products manufactured from such oil, and whether discriminations were practiced on the part of the company as between different producers of oil in the field, especially against the oil on Indian allotments.

THE CONTROVERSY BETWEEN THE PRODUCERS AND THE PIPE LINE.

The Healdton oil field was discovered in August, 1913. Shortly after, representatives of the Magnolia Petroleum Co. pronounced the Healdton crude oil to be a high-grade oil, similar to that from the Electra, Tex., field and the northeast Oklahoma fields. They stated publicly that they were anxious to secure a large daily supply and that the current Oklahoma crude-oil price at the wells would be paid. The Magnolia Pipe Line Co., owned by the same interests as the Magnolia Petroleum Co., was incorporated under Oklahoma laws to own and operate a pipe line in that State. Its pipe line connected at the Texas-Oklahoma boundary with the pipe line of the Magnolia Petroleum Co. By January 26, 1914, the Magnolia Pipe Line Co., which had erected storage tanks in the field, began to purchase oil and store it, in anticipation of the completion of its pipe line. There were then in the field about 15 producing wells, with an estimated total daily production of 1,555 barrels of crude oil. On January 26 the Magnolia Pipe Line Co. notified the producers that it would pay $1.03 per barrel at the wells for Healdton crude petroleum testing 32° Baumé and above, which was the current Oklahoma crude-oil price. On March 2, however, the company reduced its price for Healdton

crude oil testing less than 32° Baumé scale to 70 cents, although the current Oklahoma crude-oil price was $1.05. The price of Healdton crude petroleum testing 32° Baumé and above was raised from $1.03 to $1.05 on March 9. The pipe line company later notified the producers that on and after March 23 it would not purchase more than 4,000 barrels daily, and that it would prorate, according to Oklahoma law, the quantity taken from each producer in the proportion of his daily production to the total production. The total daily production of the field at that time was estimated at about 10,000 barrels. On March 26 the price for all grades of Healdton crude oil was fixed at 70 cents per barrel. On April 13, and again on April 20, additional reductions of 10 cents per barrel were made, bringing the price of Healdton crude oil down to 50 cents per barrel at the wells. Up to January, 1915, the price remained unchanged. In each instance the reduction in price was defended by the pipe line company on the grounds of the inferior refining qualities of the oil.

Following the first cut in price (on March 2), the producers complained to the Corporation Commission of Oklahoma, which sent a special inspector to the Healdton field to make an official test of the gravity of the crude oil. On March 13, 1914, the commission held a hearing at Oklahoma City, at which the producers and the pipe line company presented their respective sides of the case. The report of the inspector employed by the commission was, on the whole, adverse to the producers' claim that the company was not justified in its action. The commission decided to postpone the case until both the producers and the pipe line company could more thoroughly investigate the refining quality of the crude oil.

Following the cut in price to 50 cents per barrel on April 20, the producers laid their complaints before the attorney general of the State, who instituted proceedings against the Magnolia Pipe Line Co. before the Corporation Commission. The attorney general charged that the pipe line company was guilty of illegal acts in unreasonable restraint of trade, and various illegal practices, especially discrimination between different producers in its purchases of oil. The case was heard before the Corporation Commission in May, 1914. During the course of the hearing the charge against the pipe line company for discrimination between producers was virtually abandoned. Although evidence was received regarding the quality of Healdton crude, the commission made no findings on the subject. A compromise agreement was arranged out of court between the producers and the pipe line companies. This agreement was made the basis of an official order which was issued by the Corporation Commission on May 7. Among other things, this order prescribed the minimum quantities of oil to be daily purchased and run by the pipe line company from the field between certain specified dates. An

inspector for the Healdton field was appointed with full authority to investigate all runs of oil, to ascertain the production of all wells, and to apportion the amount of oil which should be taken from each producer so as to prevent any discrimination. He took charge of this work on May 12, 1914.

INVESTIGATION BY THE BUREAU OF CORPORATIONS.

In the consideration of the questions raised in the Senate resolution the Bureau investigated thoroughly the subject of the refining value of Healdton crude oil. It secured not only the results of many laboratory analyses and of test runs made on a small scale, in miniature stills holding about 1 barrel, and by refineries on a large scale, approximating commercial conditions, but it also secured from two refineries, namely, the Magnolia Petroleum Co.'s Corsicana refinery and the Pierce-Fordyce Oil Association's Fort Worth refinery, the results obtained from about 1,200,000 barrels of Healdton crude oil, which were the only important quantities of Healdton crude refined in the course of regular commercial operations. The Bureau also obtained information relating to the prices of the finished products manufactured from Healdton crude oil.

A careful investigation was made into the question of whether discrimination was practiced by the pipe line company in its purchasing of oil from different producers in the field, and particular attention was given, in this connection, to the subject of oil produced on Indian allotments. The investigation of the Bureau of Corporations included a thorough examination of the books and records of the Magnolia Pipe Line Co. and the Magnolia Petroleum Co.

VIRTUAL MONOPOLY OF MAGNOLIA PIPE LINE CO.

The Magnolia Pipe Line Co. from January 26, 1914, when it began to buy and run oil into its pipe-line system in the Healdton field, up to November, 1914, had a monopoly of the only practical means of transporting the oil from the field to a refinery market. It did not transport any oil as a common carrier. The lack of marketing facilities and the charges for transportation were such that the producers preferred to sell their oil at the wells to the pipe line company, and no oil was offered for transportation.

The pipe line company bought all the oil entering its pipe line, stored it, transported it to the boundary line between Oklahoma and Texas, and sold it to the Magnolia Petroleum Co., an allied concern. The Magnolia Pipe Line Co., in virtue of the circumstances which made it the only purchaser, as well as transporter of the oil produced in the Healdton field, in fixing the price which it would pay for the oil, at the same time fixed the market price for all the oil produced in the field.

REDUCTION OF PRICE.

With respect to the cause of the reductions in the price fixed by the Magnolia Pipe Line Co., the Bureau finds no evidence of an intent to arbitrarily depress land values in order to buy oil-producing property more cheaply or to acquire stocks of oil already accumulated at a price much below its real value. It is true that officials of the Magnolia Petroleum Co. early in the development of the Healdton field made exceedingly favorable statements in regard to the refining quality of the oil and said it was a high-grade oil. They assert that this was a bona fide mistake, and the evidence of the correspondence in the files of the Magnolia Pipe Line Co. and the Magnolia Petroleum Co. as well as their actions support this contention. When they discovered that only a relatively small proportion of gasoline and kerosene could be obtained from it, that the oil did not have enough lubricating value to make it practicable for them to use it for the manufacture of lubricants, and that it had a relatively high percentage of fixed sulphur, to remove which increased the cost of refining, the Magnolai Pipe Line Co. made the various reductions in price. This was done, they claim, in order to put the f. o. b. refinery cost of the crude oil from the Healdton field on a competitive basis with the f. o. b. refinery cost of the crudes from other fields that were available to the Magnolia Petroleum Co.'s refineries.

The Bureau of Corporations finds that the contention of the pipe line company regarding the small gasoline and kerosene content of the crude oil produced in the Healdton field is correct. It is of the opinion also that while Healdton crude is chemically adapted to the manufacture of lubricants, yet, in view of the prices at which other crudes better adapted to the manufacture of lubricants could be bought and the limited market for the lubricants obtainable from Healdton crude, its lubricant qualities added little to its market value. The fixed sulphur which is found in the Healdton crude is removable from the gasoline and kerosene by methods which are not unduly expensive, although more expensive than is necessary for other competing crudes. The sulphur, however, does not affect the value of the Healdton crude enough to justify any important reduction in the price paid for the oil. In brief, the conclusion of the Bureau is that the reductions in the price of Healdton crude oil were made because of the discovery by the Magnolia Pipe Line Co. of its small gasoline and kerosene content, and because the lubricating values of this crude were not enough to warrant, under existing conditions, its use for the manufacture of lubricants. The pipe line company, however, does not appear to be without blame for its failure to determine the true character of the oil at an early date. This would have saved much disappointment to producers.

PRICES OF CRUDE OIL AND FINISHED PRODUCTS.

In regard to the question raised in the Senate resolution, whether changes were made in the prices of the finished products manufactured from Healdton crude oil corresponding to the changes in the price of the crude, it should be noted that no finished products from Healdton crude oil were marketed until about the latter part of April, 1914, at which time all of the reductions in price had taken place.

The Bureau has made comparisons, based on the total value of the products derived from them, of the commercial values of crude oil produced in various Oklahoma, north Texas, and north Louisiana oil fields. It has made such comparisons on two bases—first, the yields shown by the analyses made by the United States Bureau of Mines, which uses a standard method of testing for all kinds of crudes, and second, the yields shown by regular refinery operations. The results of both comparisons show that the products derived from Healdton crude are distinctly less valuable than those derived from other crudes which were available to the Magnolia Petroleum Co.'s refineries. Consequently, under competitive conditions the price of Healdton crude would naturally be lower.

DISCRIMINATION BETWEEN PRODUCERS.

In considering the question raised in the Senate resolution, whether discriminations were made by the Magnolia Pipe Line Co. between different producers in the Healdton field, and especially against the oil produced on Indian allotments, the Bureau has limited its investigation to the period between January 26, the date that the pipe line company began to purchase oil from the producers in the Healdton field, and May 12, the date on which the inspector appointed by the Corporation Commission of Oklahoma took charge of the determination of the quantity of oil to be taken by the pipe line company from each of the various producers in the field.

The Bureau has carefully examined all of the testimony in the record of the Corporation Commission hearing in May, 1914, at which time the charge of discrimination was officially brought before the commission in the complaint filed by the attorney general. Additional evidence bearing on this subject has been collected by the Bureau. It consists of information gathered in interviews with persons in a position to know the facts, of sworn statements, and of statistical material gathered from the records of the Magnolia Pipe Line Co. and, whenever it was possible to obtain it, from the records of the producers themselves.

In the absence of any Federal statute defining what constitutes discrimination by pipe lines, the Bureau has based its work on the Oklahoma statute dealing with the subject. As there has been no judicial construction of several points involved in the application of this law to the conditions found to have existed in the Healdton field, the Bureau has been obliged in answering the question raised by the Senate resolution, to apply its own interpretation. Under the Oklahoma law, the pipe line company must either purchase all the current output of each producer or take such proportion of his output as his production bears to the total production. The pipe line company is allowed a period of 30 days in which to correct inequalities.

The lack of definite verifiable records dealing with the production at this early period makes it difficult to determine the facts exactly. Few producers had any such records and the records of the Magnolia Pipe Line Co., while accurately showing the quantity of oil taken from each producer, contain only estimates of the production, and statements of doubtful accuracy concerning the oil held in storage in the producers' tanks. The pipe line company at this early period considered itself able to take all of the current production of the field without difficulty and therefore did not pay special attention to the matter of making its purchases from the different producers in proportion to their production.

The Bureau found no evidence of any intent on the part of the pipe line company to discriminate between the different producers or against the oil produced on Indian allotments. The Bureau did find, however, that at various periods some producers may have been favored at the expense of others. Under the law the pipe line company should either have taken the total production or should have prorated its purchases and equalized them within 30 days. In the case of most of the producers temporary inequalities were apparently corrected within the legal period. The unreliability of existing records relating to production and the unsettled question as to what legally constitutes discrimination, preclude a positive statement in regard to the subject.

Very respectfully,

JOSEPH E. DAVIES,
Commissioner of Corporations.

The PRESIDENT.

CONDITIONS IN THE HEALDTON OIL FIELD.

CHAPTER I.

INTRODUCTION.

Section 1. Statement of questions involved.

This report is made in answer to Resolution No. 319, passed by the Senate on March 28, 1914. The resolution reads as follows:

> *Resolved*, That the Secretary of Commerce is directed to investigate and report to the Senate, at as early a date as practicable, as to the cause of the recent reduction in the price of crude oil in the Ardmore oil field in the State of Oklahoma on the part of the Magnolia Pipe Line Company; and also as to whether corresponding changes have been made in the prices of the finished products manufactured from such oil.
>
> Second. To make like investigation and report as to whether discriminations are practiced on the part of said company as between different producers of oil in the above-mentioned field, and especially as to whether any discrimination is practiced against the oil produced on Indian allotments.

The Ardmore oil field referred to in the resolution is now generally called the Healdton oil field.

In addition to answering in detail the various questions in the resolution, it has seemed desirable to discuss matters not directly mentioned in the resolution, but which are necessary to a clear presentation of the situation.

The Magnolia Pipe Line Co. is an Oklahoma corporation which buys, transports, and sells crude petroleum obtained from the Healdton field. It is legally distinct from the Magnolia Petroleum Co., a Texas corporation, but it is closely connected, however, with that company, because the majority of the stock of both companies is owned by the same interests and the business policies of the Magnolia Pipe Line Co. have been under the same final control as those of the Magnolia Petroleum Co. Furthermore, all of the oil bought by the Magnolia Pipe Line Co. and transported to the Texas line has been sold to the Magnolia Petroleum Co. The Corsicana Petroleum Co., which is one of the oil-producing companies in the Healdton field, is also closely connected with the Magnolia Petroleum Co., the majority of the stock of both companies being owned by the same interests and the business policies being under the same final control.

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The information for this report was obtained through interviews and correspondence, from the official reports of the hearings before the Corporation Commission of Oklahoma, and from the books and records of companies involved. Representatives of nearly every company operating in the Healdton field in April, 1914, were interviewed by agents of the Bureau of Corporations, and information was sought from them on all of the various questions at issue.

Few producers were able to furnish definite, first-hand information in regard to many important details of their own properties and operations, and could give even less information of that nature concerning other producers in the field. Concerning such details as the gravity of the crude from their wells, the exact quantity of daily production, and the quantity of oil run from their leases during the period previous to May 12, when the inspector appointed by the Corporation Commission of Oklahoma took charge of prorating the production, little information was possessed by the producers themselves. Only a few of the producers had taken steps to have their crude oil analyzed by chemists, or tested by refiners, to determine its quality.

Since the producers lacked definite records which would throw light on the questions at issue, such as whether discrimination between producers took place, and what is the comparative commercial value of the crude oil based on its yield of marketable products, definite information bearing on these subjects had to be obtained by the Bureau from the records of companies handling the oil, namely, the Magnolia Pipe Line Co., the Magnolia Petroleum Co., and the Pierce-Fordyce Oil Association. In order to establish the accuracy and reliability of such information, not only were the entries in the usual permanent records examined, but, whenever it seemed desirable, search was made through the original daily reports of employees concerning the quantities of crude oil run and refined, and concerning the routine tests made of the quality of the oil. Sales of products from Healdton crude were traced to the hands of bona fide consumers and the circumstances concerning such sales and shipments ascertained. The information obtained from the Magnolia sources has been scrutinized closely and, wherever practicable, has been tested by comparison with information obtained from other sources. In some instances where the information was of such a nature that it could not be verified by existing records the Bureau obtained from the informants sworn statements respecting the facts.

Section 2. Brief history of the Healdton field.

The Healdton field (sometimes referred to as the Ardmore field) is located in the southwestern part of Carter County, Okla. It is situated about 23 miles west of Ardmore and about 26 miles east of

Addington. These points were the nearest railroad connections at the time the field was discovered. Since that time, the construction of the Oklahoma, New Mexico & Pacific Railway from Ardmore through Wilson,[a] about 5 miles from the Healdton field, has afforded a nearer railroad connection.

At the time the discovery well was brought in (Aug. 6, 1913) the nearest through pipe lines to the Gulf of Mexico were the Magnolia Petroleum Co.'s pipe line, from the Electra field in Texas, the nearest point on its route being about 44 miles distant to the southwest; the Texas Co.'s pipe line from the same field, the nearest point, Petrolia Station, being about 37 miles distant; and the Texas Co.'s pipe line from the Cushing field to the Gulf, about 69 miles to the southeast. There was also a 6-inch pipe line running from the Wheeler oil field to Ardmore, the nearest point to Healdton on its route being about 8 miles to the northwest. This line is owned by the Santa Fe Railroad, and was used to carry fuel oil to Ardmore from wells owned by the railroad.

In 1912 the Magnolia Petroleum Co. projected a pipe line to connect the Cushing field in Oklahoma with the company's refineries in Texas. The proposed route brought the main pipe line across Oklahoma through the next county west of Carter County, and made it practicable to extend a branch line into the Healdton field. Soon after the discovery well of the Healdton field was brought in, representatives of the Corsicana Petroleum Co. visited the new field, took a sample of the oil, and made attempts to buy producing land. Later, D. C. Stewart, then manager of the pipe-line department of the Magnolia Petroleum Co., stated to the producers that the oil was high grade and that the company needed all it could get and would pay the current Oklahoma price. He urged producers to bring in new wells, and in some instances they were furnished the use of tanks by the Magnolia Petroleum Co. in which to store their oil, pending the completion of the pipe line. The producers had to pay the expense of installing these tanks and had the option of buying them later on. About the middle of December, 1913, the Magnolia Pipe Line Co., which, as already stated, is owned by practically the same stockholders as the Magnolia Petroleum Co. and the Corsicana Petroleum Co., was organized as a common-carrier pipe line under the Oklahoma State laws. This company owns an 8-inch main pipe line, about 26 miles long, which, connecting at the Texas-Oklahoma boundary with the Magnolia Petroleum Co.'s pipe line, extends to Addington, Okla., from which point a 6-inch branch pipe line, about 26 miles long, was laid to the Healdton field.

In the Healdton field the company had on September 30, 1914, about 45 miles of gathering lines, three 55,000-barrel steel storage

[a] The post office is New Wilson.

tanks, and a pumping station. It also had pumping stations at Mud Creek and Waurika, Okla. On September 21, 1914, the Magnolia Pipe Line Co. leased from the Magnolia Petroleum Co. the latter's 8-inch pipe line and its equipment, extending from the Texas State line to Fort Worth, Tex. Two 55,000-barrel steel tanks at Alvord, Tex., and four 55,000-barrel steel tanks at Fort Worth were part of the equipment leased. The distance of the pipe line from Healdton to Fort Worth is about 125 miles. The pipe line was opened for the regular business of transporting oil from Healdton on March 11.

On January 26, 1914, the date on which the Magnolia Pipe Line Co. began to buy and store oil in anticipation of the opening of its pipe line, it notified producers that its price on "Oklahoma crude petroleum 32° and above" would be $1.03 per barrel at the wells. This was also the prevailing price paid at that time by the large pipe-line companies in the other Oklahoma oil fields.

On February 2, 1914, the price of Mid-Continent oil at the wells was advanced to $1.05 per barrel. On March 2, 1914, the Magnolia Pipe Line Co. notified the producers that on runs of March 2 and until further notice their price on Healdton crude under 32° Baumé test would be 70 cents per barrel at the wells. On March 9 it posted another notice stating that until further notice the price on Healdton crude oil 32° Baumé test and above would be $1.05 per barrel. The company claimed that this distinction in price on the basis of gravity was made because it had found that a considerable part of the oil was heavy and fit chiefly for use as fuel.

There was much dissatisfaction on the part of the producers over this action, and it was called to the attention of the Corporation Commission of Oklahoma. The commission took immediate steps to investigate conditions in the Healdton field. With a view to obtaining authentic information concerning the general character of the Healdton crude oil the commission sent a special inspector to the Healdton field to make an official test of the gravity of the crude oil. On March 13, 1914, it held a hearing at Oklahoma City at which the producers and the pipe-line company were given every opportunity to present their respective sides of the case. According to the report of the inspector employed by the commission much of the oil tested was found to be under 32° Baumé. He called attention, moreover, to the odor of sulphur noticeable over the field, and gave it as his opinion that the Healdton product could easily be rated as a fuel oil in contradistinction to a refining oil. (See full report of H. L. Wood, Exhibit 2, p. 94.)

After hearing the testimony the commission decided that, in the absence of accurate and reliable information as to the refining quality of the crude oil, further consideration of the case should be postponed

until such time as both the producers and the pipe-line company could make a thorough investigation. The commission's special inspector reported an estimated total daily production from the 37 producing wells in the field of about 7,000 barrels a day. At the hearing the question of the ability of the pipe-line company to take care of the total production of the field was raised by the producers. In reply the counsel for the pipe-line company promised that it would take 10,000 barrels of oil per day.

Subsequently the pipe-line company gave notice that commencing March 26 their price on all grades of Healdton crude would be 70 cents per barrel at the wells. They also, on about March 23, gave oral notice that the pipe-line company would take only 4,000 barrels per day from the field. At this time the estimated daily production of the field was about 10,000 barrels. Following their purpose to cut the price of the crude to a fuel-oil basis, additional reductions of 10 cents per barrel each were made on April 13 and 20, thereby bringing the price of the Healdton product down to 50 cents per barrel. In each instance the reduction in price was defended by the pipe-line company on the grounds of the heavy character and inferior refining qualities of the oil. The 50-cent price remained unchanged up to January, 1915.

The action of the pipe-line company in placing all Healdton oil, regardless of gravity, on the basis of a fuel-oil crude, the subsequent two 10-cent cuts in price, and the reduction of the quantity of its daily runs to a point considerably below the daily production of the field, aroused much opposition on the part of the producers. At the time of the first 10-cent cut, on April 13, the counsel for the Magnolia Pipe Line Co. addressed a meeting of the Healdton producers at Ardmore. He outlined various plans which the Magnolia interests had under way for taking care of the oil, such as the building of a new refinery at Fort Worth, Tex., especially equipped for treating Healdton oil, the erection of storage tanks at Fort Worth, and the increase of the pipe-line carrying capacity by the construction of additional pipe line and pumping stations. When questioned as to the promise made by him at the March 13 hearing of the Corporation Commission to take 10,000 barrels daily, he admitted that he had made a mistake because he did not then understand the difficulties of the situation. He maintained, however, that the company's tests since March 13 had showed that the Healdton crude should be considered a fuel-oil crude, and not a refinable crude.

The cut in price on April 20 to 50 cents per barrel and the continued failure of the company to increase its facilities for handling the current output of the field, thereby throwing on the producers the burden of storing their surplus oil, aroused the producers to a high pitch of dissatisfaction. Their leaders complained to the at-

torney general of the State, who immediately filed a complaint against the Magnolia Pipe Line Co. before the Corporation Commission of Oklahoma. The attorney general charged that the pipe-line company was guilty of illegal acts in unreasonable restraint of trade, and had engaged in forbidden practices in purchasing and piping oil from the Healdton field, including discrimination between different producers in its purchases of oil. (See p. 67.)

The Magnolia Pipe Line Co. filed an answer denying specifically most of the allegations in the bill of complaint. (See p. 66.) The case was heard before the Corporation Commission from May 1 to 6, inclusive. During the course of the hearing the charge against the company of discrimination between producers in running the oil from the field was virtually abandoned. Much conflicting testimony was offered in regard to the quality of Healdton crude, but none of it was considered conclusive enough by the commission to warrant its making a decision, and further investigation was held to be necessary. The questions of increased pipe-line facilities and additional tankage for the storage of the surplus oil were gone into at length. Finally a compromise agreement was arranged, out of court, on May 5 between the producers and the counsel for the pipe-line company. A part of this agreement was embodied in an official order (Order No. 814) which was issued by the Corporation Commission on May 7, 1914. (See Exhibit 1, p. 91.)

In this order, the Corporation Commission directed that the Magnolia Pipe Line Co. should within a week from May 5, 1914, begin taking a daily average of 8,000 barrels of oil from the Healdton field, and on or before July 1, 1914, and until April 1, 1915, should not take less than a daily average of 12,000 barrels of oil from said field; that it should immediately erect four 55,000-barrel steel tanks in the Healdton oil field, and that in addition to the daily average runs of oil above mentioned, it should, as per its agreement, clear the leases of all stocks of accumulated oil which were in a merchantable condition, and pay the owners of same upon delivery at the rate of 50 cents per barrel for quantities delivered.

The Magnolia Pipe Line Co. was released from its obligations under the State law as a common purchaser from the necessity of connecting with any new wells within six months from the date of the order, except under certain specified conditions. It was ordered to provide a pipe-line connection and loading facilities on the main line of the Chicago, Rock Island & Pacific Railway Co. at or near Addington (afterwards this order was modified to permit the placing of the loading rack at Waurika, instead of Addington) and to establish a reasonable rate per barrel for the transportation of oil from the Healdton field to this point when offered for such transportation in carload lots.

An inspector for the Healdton field was appointed with full authority to investigate all runs of oil, to ascertain the production of all wells, and to apportion the quantity of oil which should be taken from each producer so as to prevent any discrimination. One-half of his salary was directed to be paid by the producers and one-half by the Magnolia Pipe Line Co. It was also provided that should the commission, during the life of this order, issue an order fixing the price of oil in the Healdton field, the present order (Order No. 814) would become void when such new order fixing prices became effective.

Some of the provisions in the agreement between the producers and the pipe line company were not stated in the order. It was provided in the agreement that it was not to be construed as a violation thereof if the company were temporarily prevented from taking the stipulated average runs of oil by reason of strikes, fire, flood, or other causes over which it had no control. Also there was a clause in the agreement offering the use of the Corsicana refinery of the Magnolia Petroleum Co. for a test run of the oil under the supervision of the Corporation Commission.

The order of the commission was accepted by all interested parties, and steps were taken to give it immediate effect. The inspector appointed by the commission made such arrangements as were possible under the circumstances to prorate the runs according to the production of each lease, pending the taking of an official gauge of the wells. Drilling operations were arranged to conform with the purpose and intent of the order, and the pipe line company took steps to comply with the requirements relating to its operations.

Soon after entering on his duties the inspector appointed by the Corporation Commission made arrangements to take an official gauge of the field. The result of this gauge showed an estimated daily production for the field of 49,596 barrels. In the following table is shown certain statistical information contained in the inspector's monthly reports to the Corporation Commission regarding the number of wells and their estimated daily production at various dates:

Date.	Wells reported.	Estimated daily production.	Date.	Wells reported.	Estimated daily production.
1914.		*Barrels.*	1914.		*Barrels.*
June [24]		49,596	September 25	255	65,171
July 25		53,085	October 24	259	66,173
August 24	242	58,231	November 25	263	68,855
August 25	242	58,431	December 24	268	68,058
September 24	256	65,460			

On June 9, at a hearing of the Corporation Commission at Oklahoma City, Irving C. Allen, petroleum chemist of the United States Bureau of Mines, gave testimony concerning the results of analyses made by the Bureau of Mines of crude oil from the Healdton and other Oklahoma fields and the relative values of the different crudes. No action on the subject was taken by the commission at this hearing.

In August, owing to the disruption of the export trade and financial disturbances caused by the European war, the Magnolia Pipe Line Co. concluded that it could not handle the quantity of oil it was required to run by the order of the Corporation Commission of May 7, and with a view to obtaining relief a conference was arranged with the producers on August 14 at Ardmore, Okla. At this conference Corporation Commissioner George A. Henshaw objected to any further reduction in the price, and a supplementary agreement was entered into between the Magnolia Pipe Line Co. and the producers. By this agreement the pipe line company was permitted to reduce the quantity of oil to be run, beginning September 1, 1914, from 12,000 barrels to 8,000 barrels per day until January 1, 1915, and furthermore, the producers agreed to accept part payment for their oil in scrip issued by the pipe line company, bearing interest at the rate of 6 per cent per annum.

In the latter part of the month an electrical storm started what proved to be one of the most disastrous fires that ever visited the Oklahoma oil fields. Practically every producer in the Healdton field suffered more or less, the total quantity of oil destroyed being estimated at from 375,000 to 400,000 barrels.

About September 30 the Magnolia Pipe Line Co. served notice on the Corporation Commission and the attorney general of Oklahoma that, beginning October 6, the price of Healdton crude would be reduced to 40 cents per barrel. The Corporation Commission immediately issued an order forbidding the Magnolia Pipe Line Co. from purchasing or receiving or transporting oil for which it had paid or agreed to pay less than 50 cents per barrel, and, furthermore, forbidding the producers to sell their oil at less than 50 cents per barrel, and warned them that if oil held in storage should be sold for less than that price, the producer would be penalized in the quantity taken by the pipe line company at the next prorating. Pending the hearing of the Corporation Commission in the matter of the proposed reduction in price, the Magnolia Pipe Line Co. did not put the new price into effect.

The hearing took place at Ardmore, Okla., on October 22 and 23. The Magnolia Pipe Line Co. presented a number of witnesses who testified as to the operations of the company. The cost of raising crude oil to the surface, cost of gathering, overhead costs, etc., were

discussed, and particular attention given to the quality and refining value of products obtainable from Healdton and Cushing crudes. With a view to disposing of the controversy over the price of the Healdton crude, Corporation Commissioner Henshaw tried to induce the producers and the pipe line company to consent to the establishment of a permanent differential between the two crudes, making the price of Healdton crude 20 per cent lower than the Cushing crude, so that the price of Healdton crude would be automatically governed by the price paid for the Cushing oil. The pipe line company, however, declined to accept this plan, stating that while this ratio of difference might then obtain such a condition might not prevail at some future time.

At the close of the hearing the Magnolia Pipe Line Co. announced that it would continue to take Healdton crude at 50 cents a barrel in such quantities as it could use, estimating the runs at from 6,000 to 8,000 barrels a day. No order was issued by the commission. The net result was that, while the price of 50 cents per barrel was continued, the company was required to take only such part of the production as it might need to fill current requirements.

In October the pipe line company finished running the "stock" or storage oil, which it had agreed to take from the leases in accordance with the Corporation Commission's Order No. 814 of May 7, directing that in addition to the daily average quantity of oil which was stipulated in the order the Magnolia Pipe Line Co. should, in compliance with the agreement which that company had made with the producers, clear the leases of all "stock" oil accumulated up to May 5 which was in merchantable condition and pay 50 cents a barrel for it.

On November 25, the Corporation Commission issued Order No. 878, which permitted the producers to sell their "stock" (accumulated storage) oil at 30 cents per barrel.

CHAPTER II.

CAUSE OF THE REDUCTION IN THE PRICE OF HEALDTON CRUDE PREVIOUS TO MARCH 28, 1914.

Section 1. Conflicting claims of producers and pipe line company.

The language of the Senate resolution passed on March 28, 1914 (see p. 1), calls for:

> The cause of the recent reduction in the price of crude oil in the Ardmore [Healdton] oil field in the State of Oklahoma on the part of the Magnolia Pipe Line Company.

As already stated in the historical outline of the Healdton field, there were, previous to March 28, two reductions in the price. The first took place on March 2, when the price of Healdton crude testing under 32° gravity Baumé standard[a] was reduced from $1.03 to $0.70 a barrel; the second, on March 26, when the price for all crude from the Healdton field regardless of Baumé test was fixed by the company at $0.70 a barrel.

CLAIMS OF THE PRODUCERS.—The causes alleged, on the part of the producers, for the Magnolia Pipe Line Co.'s action, were the same in the case of both reductions. These reductions were claimed by them to be the result of an endeavor of the pipe line company, by use of its monopolistic power in the field, to depress the value of oil-producing property and of unproven territory where the prospects for production seemed favorable, by a lowering of prices, with a view to buying it cheap through the medium of allied producing companies; also to acquire at a low price the large stocks of oil already above ground, or known to be available from wells then existing in the field.

The pipe line company's virtual monopoly.—Both charges involve the status of the Magnolia Pipe Line Co. in the Healdton field. The Oklahoma law, under which the company must operate its pipe line, requires it to be a common carrier and, if it buys oil, a common purchaser, without discrimination, from all producers in the field. This provision is contained in an act which took effect March 27, 1909, popularly known as the Yeager-Strain Law, to which all pipe lines engaged in transporting crude petroleum or its products, in

[a] While in its notice of Jan. 26 the price posted by the company was for "Oklahoma crude petroleum 32° and above," the records show that for all oil taken into its lines by the company prior to March 2, one price was paid without regard to any gravity test.

intrastate commerce, are made subject. The Magnolia Pipe Line Co. bought the oil before transporting it, and thus came under the provision of the law requiring it to be a common purchaser. It therefore had, by virtue of the character of its business, certain obligations of a public-service nature, and in the conduct of its affairs its freedom of action was limited to that degree.

The attitude of the producers, in relation to the monopolistic control which they claimed was exercised by the Magnolia Pipe Line Co. in the Healdton field, is well stated in the complaint against the company, filed by Attorney General West before the Corporation Commission and considered by it at its hearing of May 1–6, 1914. In his bill of complaint he set forth—

> that the defendant is the only pipe line company engaged in the transportation of oil from said Healdton Field; that it handles many thousands of barrels daily, and that by reason of the nature and extent of its said business and the existence of a virtual monopoly therein, is such that the public must use the services of said defendant and its product of oil, produced, piped, bought and sold, at the city of Ardmore and Carter County, as to make its said business of public consequence, and to affect the community at large, as to its supply, demand and price or rate thereof, so that said business is a public business subject to be controlled by the State, by the Corporation Commission, as to all of its practices, prices, rates and charges, as defined by Section 8235,[a] Revised Laws of Oklahoma, 1910, and that it is now a common carrier and common purchaser, under the law, of all oil being produced in and piped from said Healdton Oil Field.

The answer filed by the Magnolia Pipe Line Co. denies that it is a virtual monopoly. It states on this subject:

> The Magnolia Pipe Line Company denies, however, that it is a virtual monopoly in the purchase and transportation of oil in said field, or that the public must use its service, or that its business, except its transportation business proper, is of public consequence. In this connection this defendant says that while it is the only pipe line now extending into said field, other pipe lines could, if they found it profitable to do so, at a reasonable cost not to exceed that incurred by this defendant, construct and extend their lines from nearby connections into the Healdton Field and compete with this defendant, and thus afford another outlet to the markets of the world, or the producers themselves could at reasonable cost build a pipe line to connect with the railroads and other pipe lines near by, and thus obtain another outlet

[a] SEC. 8235. *Public business defined.*—Whenever any business, by reason of its nature, extent, or the existence of a virtual monopoly therein, is such that the public must use the same, or its services, or the consideration by it given or taken or offered, or the commodities bought or sold therein are offered or taken by purchase or sale in such a manner as to make it of public consequence or to affect the community at large as to supply, demand or price or rate thereof, or said business is conducted in violation of the first section of this article, said business is a public business, and subject to be controlled by the State, by the corporation commission or by an action in any district court of the State, as to all of its practices, prices, rates and charges. And it is hereby declared to be the duty of any person, firm or corporation engaged in any public business to render its services and offer its commodities, or either, upon reasonable terms without discrimination and adequately to the needs of the public, considering the facilities of said business. (Revised Laws of Okla., 1910, Vol. II, p. 2232.)

to the markets of the world for said oil. In this connection this defendant shows that its pipe line connects said field with the Rock Island Railroad, and that by constructing only some eight or ten miles of pipe line, said field could be connected with the railroad of Okla. N. Mex. & Pacific Company, which connects with the rail line of the Atchison, Topeka & Santa Fe Railway at Ardmore; that both the Rock Island Railroad and the Santa Fe connect with the markets of the world, and through them and the pipe lines connecting said field with said rail lines the producers could dispose of their product to purchasers in competition with this defendant. This defendant shows that while its pipe line connects said field with the Rock Island Railroad, none of the producers have seen fit to tender any oil to this defendant for transportation to the Rock Island Railroad or to make any demand on this defendant for such transportation. This defendant will, at reasonable cost, perform such transportation services and put in the facilities appropriate thereunto if the producers give reasonable notice of such demand and provide necessary tankage or other facilities to receive the oil at destination.

It will be noted that the Magnolia Pipe Line Co. based its denial of being a virtual monopoly on the following grounds:

1. Other pipe lines could, if they so desired, extend their lines into the Healdton field, or the producers themselves could build a pipe line to connect with the railroads and other near-by pipe lines, thereby furnishing additional outlets.

2. That the Magnolia Pipe Line Co. itself connects the Healdton field with the Rock Island Railroad and is ready to transport, as a common carrier, to its point of connection with the railroad, any oil which may be tendered it for transportation by the producers, subject to "reasonable cost," "reasonable notice of such demand," and the provision by the shipper of "necessary tankage or other facilities to receive the oil at destination."

The facts in regard to the available outlets for the oil from the Healdton field, through pipe lines connecting it with the outside markets or through pipe lines and railroad transportation combined, must be taken into consideration. The Magnolia Pipe Line Co. was up to November, 1914, the only through pipe-line outlet by which the Healdton oil could be taken from the field to the outside markets.

The expense of railroad transportation is practically prohibitive, even were there reasonable pipe-line charges imposed for carrying the oil from the field to the railroad. The quantity that can be profitably consumed locally, or by refineries so situated that they can pay the expense of pipe-line and rail transportation, is, and has been, so small as to be negligible in the consideration of this subject.

It was within the power of other through pipe lines to enter the field, or for producers to build pipe lines to connect with them. As a matter of fact, however, the amount of capital involved in such an undertaking was, up to November, 1914, beyond the means of the producers, even had they been able to organize for the undertaking. Furthermore, the prospects of the field have not yet been sufficient to induce the Texas Co., the nearest of the other through pipe lines, to build a branch connecting the field with either of its through pipe lines between Port Arthur, Tex., and the Electra (Tex.) field or the Cushing (Okla.) field, although the Producers' Oil Co., a producing company owned and controlled by the same interests as the Texas Co., own and operate considerable producing property in the Healdton field. Under the conditions which have actually prevailed since the discovery of the field and up to November, 1914, the Magnolia Pipe Line Co. has unquestionably had a virtual monopoly of the only practicable means of transportation for the output of the field.

Alleged intent to depress land values.—The question of whether or not the pipe line company made use of its monopolistic power to depress the values of oil-producing property and unproven territory, with a view to buying it cheap through the medium of allied producing companies, must be examined in the light of definite actions on the part of the Magnolia interests.

The Magnolia Pipe Line Co. did not produce any oil itself; it merely bought the oil produced by others and transported and sold the same. One of the producing companies, however, is closely connected with the Magnolia interests (see p. 1), namely, the Corsicana Petroleum Co. This company owns producing wells and also other property in the Healdton field. Soon after the bringing in of the discovery well, a representative of this company tried to buy the property on which the well was located. Failing in this, he tried to buy a part interest, but in this also he was unsuccessful. Later, the Corsicana Petroleum Co. was able to secure land or leases elsewhere in the field. The records of the company show that all of the holdings of the Corsicana Petroleum Co. in the Healdton field are by oil and gas leases, none of which were producing or operated at the date of acquisition by the Corsicana Petroleum Co. The following table shows a number of details concerning these leases:

TABLE 1.—HOLDINGS [a] OF CORSICANA PETROLEUM CO. IN THE HEALDTON FIELD, OCT. 7, 1914.

Date.	Lessor.	Acres.	Description.	County.	Working interest.
1913.					
October 26	Roy Chilton	70.62	W. ½ of NW. ¼ of NE. ¼; NE. ¼ of NW. ¼; SE. ¼ of NW. ¼ of NW. ¼; sec. 4, T. 4 S., R. 3 W.	Carter	Cors. Pet. Co., all.
September 3	J. A. Smalley	160.00	NE. ¼ of sec. 10, T. 4 S., R. 3 W	do	Do.
September 11	Jno. B. Rose	110.00	S. ½ of N. ½ of NW. ¼; N. ½ of SW. ¼ of NW. ¼; SE. ¼ of SW. ¼ of NW. ¼; SE. ¼ of NW. ¼; sec. 23, T. 4 S., R. 3 W.	do	Do.
Do	Wm. A. Daniels	140.00	E. ½ of NE. ¼ of SW. ¼; W. ½ of NW. ¼ of SW. ¼; S. ½ of SW. ¼; W. ½ of NW. ¼ of SE. ¼; sec. 23, T. 4 S., R. 3 W.	do	Do.
September 19	Tidewater Oil Co	50.00	W. ½ of E. ½ of NE. ¼; W. ½ of NE. ¼ of NE. ¼; E. ½ of NW. ¼ of NW. ¼; sec. 17, T. 4 S., R. 3 W.	do	Do.
December 1	P. C. Dings	30.00	S. ½ of SE. ¼ of NE. ¼; SE. ¼ of SW. ¼ of NE. ¼; sec. 32, T. 3 S., R. 3 W.	do	Do.
October 28	Mrs. Wm. E. Thompson	150.00	W. ½ of NE. ¼; SW. ¼ of SE. ¼ of NE. ¼; E. ½ of NE. ¼ of NW. ¼; SW. ¼ of NE. ¼ of NW. ¼; N. ½ of SE. ¼ of NW. ¼; SW. ¼ of SE. ¼ of NW. ¼; sec. 30, T. 3 S., R. 3 W.	do	Do.
December 2	E. T. Richards [b]	170.00	SW. ¼ of SE. ¼; W. ½ of SE. ¼ of SE. ¼; NE. ¼ of SE. ¼ of SE. ¼; SE. ¼ of SW. ¼; NE. ¼ of SW. ¼ of SW. ¼; sec. 31–3–3.	Carter and Jefferson.	Cors. Pet. Co., one-half; McMan Oil Co., one-half.
December 11	do [c]	200.48	SW. 10 acres of lot 1, lot 2; NE. 10.13 acres of lot 3, NE. ½ of SW. ¼ of NE. ¼; NW. ¼ of SE. ¼ of NE. ¼; sec. 6–4–3.		
December 2	E. T. Richards, guardian [b]	150.00	N. ½ of SE. ¼; E. ½ of NE. ¼; E. ½ of NW. ¼ of NE. ¼; SW. ¼ of NE. ¼; E. 2 of SE. ¼ of NW. ¼; SE. ¼ of NE. ¼ of NW. ¼; SW. ¼ of NW. ¼ of NE. ¼; sec. 31–3–3.	Carter	Do.
December 11	E. T. Richards, guardian (Clifton Richards's lease). [c]	130.00	SE. ¼ of SW. ¼ of SE. ¼; SW. ¼ of SE. ¼ of SE. ¼; sec. 30–3–3		
December 2	Mrs. Dollie May Ansley, guardian (Henry R. Ansley's lease). [b]	10.00	SE. ¼ of SE. ¼ of SE. ¼; sec. 31–3–3	do	Do.
August 12	W. L. Coffee, guardian [d]	85.00	W. ½ of NW. ¼ of NE. ¼; E. ½ of NE. ¼ of NW. ¼; NW. ¼ of SE. ¼ of NW. ¼; N. ½ of S. ½ of SW. ¼ of NW. ¼; N. ½ of SW. ¼ of SE. ¼ of NW. ¼ of sec. 15, T. 4 S., R. 3 W.	do	Do.

October 6	David Ward, guardian [e]	204.03	Lot 1 and NE. ¼, SW. ¼, NE. ¼, and SE. ¼ of NE. ¼ of sec. 1, T. 4 S., R. 4 W., and W. 11.94 of SW. ¼ of NW. ¼ of sec. 6, T. 4 S., R. 3 W.	Carter and Jefferson.	Cors. Pet. Co., all interest in 102.03 acres; W. G. Skelly, all interest in 102 acres.

[a] All holdings of Corsicana Petroleum Co. in Healdton field are by oil and gas leases, none of which were producing or operated or in proven territory at date of acquisition by Corsicana Petroleum Co.

[b] Lease granted to McMan Oil Co. and one-half interest assigned to Corsicana Petroleum Co. on Mar. 4, 1914.

[c] Lease granted to Corsicana Petroleum Co. and one-half interest assigned to McMan Oil Co. on Mar. 4, 1914.

[d] Lease granted to J. L. Hamon and Ray Colcord and assigned one-half to Corsicana Petroleum Co. and one-half to McMan Oil Co. on Nov. 24, 1913.

[e] Lease to W. G. Skelly and 102.03 acres assigned to Corsicana Petroleum Co. on Oct. 15, 1913.

It should be noted that the Corsicana Petroleum Co. has not extended its holdings since December 11, 1913. This was about three months before the reduction in the price of oil took place.

In refutation of the charges that the Corsicana Petroleum Co. had sought to take advantage of the field conditions and cuts in the price of oil since March 2 to increase its holdings, George C. Greer, general attorney for the Magnolia interests, in interviews with representatives of the Bureau of Corporations, and also in various letters, described the position of the Corsicana Petroleum Co. in this matter. He stated that it had been its policy to abstain from increasing its holdings for two reasons—first, because its actions in that respect would be the subject of misunderstanding and criticism, and second, because it was impracticable, owing to unsettled financial conditions.

Mr. Greer furthermore stated that a number of attempts had been made by owners of producing property in the Healdton field, and by others who claimed to act for them, to induce the Corsicana Petroleum Co. to increase its holdings by either buying their property—stock control in their companies—or going in with them, either secretly or openly, and buying up such properties as might be purchased on favorable terms. He described four such instances in detail, specifying names, dates, and other particulars of the proposals that were made.

Inasmuch as it has been ascertained by the Bureau that the Corsicana Petroleum Co. has not increased its holdings in the Healdton field since the first cut in price took place, it is not necessary to go into this question, nor to consider further the validity of this charge made by the producers.

Alleged intent to depress crude-oil values.—The next question is how far the pipe line company made use of its monopolistic power to depress the market price for oil, with a view to acquiring at a low price the large stocks of oil already above ground, or available from the wells then existing in the field. In the determination of this question the factor of intent, in the absence of an admission, and, indeed, in the face of a direct denial on the part of the company that such was its object, must be studied through the examination of the surrounding circumstances. Briefly stated, the facts upon which this contention was based were—that the producers had been urged by representatives of the Magnolia interests to develop the field, under promise that all their production would be bought, and that ample facilities for taking care of the output would be provided; that after they had gone ahead in good faith and brought a large quantity of oil to the surface and developed the existence of a large potential production, the Magnolia Pipe Line Co. cut the market price of the oil, refused to buy and store the oil already above ground, in excess of the company's existing tankage capacity, and

cut down its daily purchases and runs from the field far below the existing output of the field, and the actual carrying capacity of its pipe line. The contention of the producers was that after having, through the early promises, stimulated the development of a large output, the action taken by the Magnolia Pipe Line Co. was unjustifiable, and was taken in order to depress, arbitrarily, the price of Healdton oil at a time when it was practically the sole purchaser in the field.

That various assurances were given to producers in the early days of the development of the field, on the part of representatives of the Magnolia interests, that all the production would be needed by the Magnolia refineries, and that some of the early producers were urged to develop their property, and tanks were loaned them in which to store their oil until the Magnolia interests could run it into the storage facilities to be erected in connection with their pipe line, are facts amply established by the evidence. That the company first made a discrimination between oil under 32° Baumé and oil over that standard,[a] and reduced its purchasing price for the former from $1.05 to $0.70 a barrel, and later put all oil from the Healdton field, regardless of gravity tests, on the same basis, at a purchase price of $0.70, are facts also established by the evidence and not disputed. The evidence also shows that there was a reduction of daily runs and a refusal to build storage tankage in the Healdton field to take care of the surplus.

CLAIMS OF THE PIPE LINE COMPANY.—The Magnolia Pipe Line Co. asserts that its early promises were based on a mistake, on the part of its representatives, regarding the actual refining value of the Healdton crude, and that its later actions in regard to prices and runs were forced upon it through economic causes, and were not arbitrary nor unjustifiable under the circumstances. Briefly stated, the claim of the Magnolia Pipe Line Co. is that its representatives made a mistake in their early estimates of the refining qualities of Healdton crude, and that as soon as their more complete analyses and tests had demonstrated the fact that because of its heavy character and its sulphur content the Healdton oil was chiefly valuable for fuel use, rather than for refining, it became necessary to buy it at a price corresponding to that of the fuel-oil crudes of the other fields—the heavy Caddo, the south Louisiana and Texas, and the Mexican crudes, with the products of which it entered into competition in the Texas markets.

Furthermore, because of the quality of the oil and the need of keeping it separate from the other crudes, such as Electra and Corsicana, it was unduly expensive to take off the lighter products by

[a] In regard to the notice of Jan. 26, see note on p. 10.

"topping" at the Magnolia Petroleum Co.'s existing refineries at Corsicana and Beaumont. It was desirable, instead, to build a large refinery at Fort Worth, Tex., especially equipped to handle the Healdton crude, to build a special pipe line from Alvord, Tex., to the Fort Worth refinery to carry the oil there, and to provide enough tankage at Fort Worth to store the crude oil until it could be "topped." The Magnolia Pipe Line Co. decided to cut down its runs from the Healdton field until such time as sufficient pipe line, storage, and refining facilities could be provided to handle larger quantities.

The position of the Magnolia interests in regard to the early assurances given to producers respecting the quality of the oil and their desire and intention to take all that could be produced is that a serious mistake was made by its representatives, but that it was a mistake honestly made. The affidavits of D. C. Stewart, F. V. Faulkner, and E. R. Brown (Exhibits 3, 4, and 5, pp. 98–102) describe the circumstances under which the mistake was made. It was admitted to this Bureau by a representative of the Magnolia interests that a lack of ordinary business precaution was shown by them in relying on field judgments as to the quality of the oil, and not first having careful and thorough analyses and tests made on substantial quantities of the oil before embarking on an undertaking of such importance.[a] A similar serious lack of business precaution was shown in not making the analyses and tests on which the first reduction of price was based (that of March 2, establishing a difference in price according to the gravity of the crude) complete enough to reveal the presence in the crude oil of sulphur of such a nature as to require an expensive method of removal.

It has been asserted by a representative of the Magnolia interests that because of these mistakes they also have suffered. They entered the Healdton field with their pipe line to obtain crude oil suitable for refining in their Beaumont refinery, to supplement the limited quantity of oil which they were able to obtain from the Electra field. They desired to secure an additional 10,000 barrels a day, and had planned a line to the Cushing (Okla.) field to secure this supply.

[a] In connection with this subject it may be pointed out that in the Oil and Gas Journal in descriptions of the newly discovered Healdton field the following statements occurred. Issue of Aug. 28, 1913, p. 12, col. 2: "The oil produced from the well is reported to be 38° gravity, while that produced in the Wheeler field is of 22° gravity." Issue of Sept. 4, p. 22, col. 4: "A test of the oil from this [the discovery] well shows 30° gravity." Issue of Sept. 18, p. 12, col. 4: "The well showed 32½° gravity oil which is by far the best grade ever found in the Carter County field." And in the issue of Dec. 11, p. 14, col. 3, in a description of the Wheeler field, it is stated: "The oil in the Oil City development is 19° gravity, while the oil found in the Healdton pool tests 32°." According to the affidavits submitted (which are confirmed by the private correspondence of the company officials between themselves), the pipe line company did not have reliable information in regard to the actual quality and character of Healdton crude until February 25, 1914.

When the Healdton field was discovered and the oil was pronounced to be a high-grade refining crude, by their representatives, it was estimated by them that the field might eventually be developed to a production of 10,000 barrels a day. The estimate of the future production of the field at that time—only one well having then been brought in—was merely a matter of judgment on the part of men experienced in oil-field conditions. When the low-grade refining qualities of the Healdton crude were established, the company not only had bought a considerable quantity of the Healdton crude at the price of high-grade refining oil, but it had to provide, at a heavy expense, special facilities to care for the future oil from the field. To supply the place of the 10,000 barrels daily of refinable crude that it had expected to get through its pipe line from Healdton, it was forced to buy crude from other fields, and have it transported by rail to Beaumont, Tex., in order to run its refinery there at its most profitable capacity.

On September 24 the Magnolia Pipe Line Co. notified the producers that on and after September 30 it would pay 40 cents per barrel. Because of action taken by the Corporation Commission, this reduction in price was not put into effect. The pipe line company, in justification of its attempt to reduce the price, abandoned its contention that the price of Healdton crude should be made to correspond with the price of the fuel-oil crudes, for not only had there been no contemporaneous fall in the prices of such crudes, but in some of the fields producing them prices had actually advanced. This rise was generally attributed in the trade papers to a heavy export fuel-oil demand, which could conveniently be supplied from such crudes. The pipe line company based its justification on the ground that, following the fall in the price of Cushing crude to 55 cents, it was much more profitable to buy this high-grade oil, transport it in tank cars to their refineries, and refine it in place of the Healdton crude. They also pointed out that the fuel oil from Cushing crude was competing with that from Healdton. They claimed that notwithstanding the export demand, fuel-oil prices were low in north Texas, the territory in which Healdton fuel oil could profitably be marketed.

The validity of the explanations offered by the Magnolia interests for the cuts in prices and runs of Healdton oil depends upon the determination of the actual refining quality of Healdton oil. If, according to the contention of the Magnolia interests, it is chiefly valuable as a fuel-oil crude, or is less valuable for refining purposes than other crudes available to their refineries, then they have sound, economic grounds for placing its price on a basis which will allow it to meet other competitive crudes. If, on the other hand, it is valuable as a high-grade refining crude, much injustice has been done to the producers.

Section 2. The specific gravity of Healdton crude oil.

It is a well-established fact that crude oils which are light or of low specific gravities are capable of yielding a larger proportion of gasoline and naphtha than those which are heavy or of high specific gravities. The crude oil coming from different wells in the same field will vary somewhat in respect to specific gravity. Tests to determine the specific gravity are made with the use of a hydrometer, the result being usually stated according to the empirical Baumé scale at 60° F. temperature. The result expressed in terms of the Baumé scale differs from that shown for specific gravity, which is the statement of the ratio of the weight of a given volume of oil to that of the same volume of water. According to the Baumé scale, the higher degrees represent the lighter gravities and the lower degrees the heavier gravities. The true specific gravities vary, broadly speaking, inversely with the degrees shown by the Baumé scale. Given the gravity in degrees Baumé, the true specific gravity can be readily ascertained by the use of empirical tables.

The highest Baumé test shown for any well in the Healdton field for which the Bureau of Corporations has been able to secure reliable information was 33.93° Baumé. This sample was taken on April 1, 1914, from a well on the Bonner lease in sec. 4, T.4S., R.3W. The lowest Baumé test was 29.27°. This sample was taken on April 2, 1914, from the McClure lease on sec. 5, T.4S., R.3W. Both of these samples were taken by representatives of the United States Bureau of Mines. All of the oil from the field is run either into the pipe line company's storage tanks or through the pipe line, without any effort being made to keep the oil from different wells separate. The Baumé test of the oil as it leaves the field for Texas averages 31.6°. The Bureau of Mines' average of 20 samples fresh from the wells in different parts of the field was 31.57° B. The average gravity of 886,254 barrels run by the Magnolia Petroleum Co. at its Corsicana refinery during the six months ending September 30, 1914, was 31.36° B. The importance of these differences in the gravity of oil coming from different wells in the Healdton field was emphasized when the Magnolia Pipe Line Co., between March 9 and March 26, paid 35 cents per barrel less for oil testing under 32° B. than for oil 32° B. and over. According to the judgment of the pipe line company's officers at that time, the oil testing 32° B. and over was classed as having valuable refining qualities, while that under 32° B. was classed as a fuel-oil crude. This was because of the greater proportion of the valuable naphtha and illuminating oils obtainable from the crude which tested 32° B. and over. Whether the oil is a trifle above or a trifle below 32° B. has no particular importance, but this has often been made the dividing line in distinguishing heavy from light crudes in the Mid-Continent field.

Section 3. Products obtainable from Healdton crude oil.

There is at the present time no standard method in general acceptance for absolutely and definitely establishing the refining quality of any given petroleum crude oil. It is possible, by variations in the refining methods used, to obtain a wide range from the same crude oil, not only in the kinds of refined products but also in the proportions in which such products are obtained. The commercial value of a crude oil depends not only on its quality—that is, its chemical constituents—but also on the cost of securing refined products from it and the market prices of such products.

Three general kinds of tests to establish definitely the character of the refined products, and the proportions in which they can be obtained, are in practical use—the laboratory distilling flask methods, the barrel still tests, and test runs made in actual refinery operations. In all three forms there are many modifications of method practiced. While in the estimation of oil men generally the actual results from runs made on a large scale under commercial conditions, by well-equipped refineries, afford the best tests of the value of a particular crude, yet from a scientific standpoint such returns are not conclusive as to the constituent elements and quality of the oil, because the market reached by the refinery may not furnish a sufficient demand for the particular refined products which, from its chemical constituents, the crude is best fitted to produce. Nevertheless, for the crudes of a particular region for which the market conditions are the same, the test of actual returns from a refinery run, if reliably made to develop the highest percentage of valuable products, should and does carry the most weight in the determination of its commercial value.

Crudes are chiefly valuable at the present time in proportion to their ability to furnish, without undue refinery investment and operative cost, either the lighter products, such as gasoline and naphtha, or high-grade lubricants from the residuum or heavier "end" of the oil. Formerly the ability to furnish illuminating oils was more highly valued than that to furnish gasoline, a product which, for many years, was either regarded as waste or had a very limited market. The development and extensive use of gasoline engines has frequently made it profitable in more recent years to increase the output of gasoline, even at the expense of reducing the output of illuminating oil. The least valuable crudes are those which are fit only for fuel purposes. While it is theoretically possible to secure, to a limited extent, most of the chief refined products, from all crudes, in practical refinery operations the expense of the methods involved or the absence of demand for certain products in the markets accessible to the refineries practically prohibits the production of some of them from certain crudes.

The Bureau has secured from a number of sources records of tests which have been made of Healdton crude oil. These include laboratory distilling flask tests, barrel still tests, and refinery runs.

THE DIFFERENCES BETWEEN TESTS FOR THE DIFFERENT METHODS OF REFINING.—The crude oil of the Kansas, Oklahoma, Louisiana, and Texas fields is refined in two types of refineries—those which extract only the naphtha or gasoline, illuminating oils, and, in some cases, gas oil, and sell the residuum for fuel oil, and those which, in addition to obtaining some of the above-mentioned products, also extract lubricants from the residuum. The first type of refineries are commonly known as "skimming" or "topping" plants; the second as "lubricating" plants. Most of the refineries situated west of the Mississippi River do not produce lubricants. The reasons for this are found in their comparatively limited markets for lubricating oils, in the more expensive plant and higher grade of skill needed to manufacture lubricants, and, to some extent, also in the profitable local markets for fuel oil. As a result, comparatively little lubricating oil is refined west of the Mississippi River from the crude oil of the Mid-Continent, Louisiana, and Texas fields, when the quantity of the crude oil, which unquestionably has considerable lubricant possibilities, is considered. The refiners have regarded it more expedient or profitable to "top" their crude and sell the residuum for fuel oil. When market conditions warrant, sometimes part of the residuum is run to gas oil, at other times all of it goes into fuel oil.

The various tests of Healdton crude of which the Bureau has secured the records have been made with two different objects in view. Some were made to show what products could be obtained if the crude were refined in a "topping" plant—that is, for gasoline, kerosene and fuel oil—and others to show the products obtainable if the crude were refined to furnish lubricants.

Attention should be called to the fact that in Tables 2, 3, and 4 there is no agreement in the use of the terms "naphtha" and "gasoline" by the different chemists and refiners. The terminology used in each report is presented in the tables. Comparisons of the different results should therefore be based on the percentage of the products obtained at the gravity specified, since the use of the names is misleading. In a paper on "The Manufacture of Petroleum Products," given in the Proceedings of the Engineers' Club of Philadelphia, April, 1913, F. C. Robinson, chief chemist of the Atlantic Refining Co., stated:

> The first group of products from petroleum is made up of gasolines and naphthas. There is some confusion among the various names, benzine, gasoline, naphtha, etc., but the best practice is to use the word gasoline for any mixture of light hydrocarbons intended for use in any kind of vaporizer; that is, to be gasified in a gas machine, gasoline torch, gasoline stove, or automobile carburetor. Also to confine the word naphtha to mixtures of hydrocarbons intended for some purpose that requires a very good odor, such as the naphtha used by cleaners, varnish-makers, soap-makers, etc. In this scheme, the word benzine finds no place. Gasolines and naphthas vary in average boiling point according to the use for which they are intended, but all lie between 125 and 280° F. In all cases it is essential that they be free from all heavy hydrocarbons that do not evaporate from the hand.

I. C. Allen, in a statement submitted with the United States Bureau of Mines' analyses to the Corporation Commission on June 9, 1914, under the head of "What is to be considered gasoline," said:[a]

> The ordinary refiner grades gasoline according to its specific gravity, using the Baumé scale. The gravity of gasoline varies within considerable limits according to the use to which it is put. The ordinary grade of automobile gasoline found on the market approximates 62 degrees Baumé.

THE LABORATORY DISTILLING FLASK TESTS.—Of the different analyses and tests of Healdton crude oil, the first to be considered are various analyses made in laboratories by the use of the distilling flask. The Bureau has secured from different sources the results of 35 separate laboratory analyses of samples of Healdton crude. Through the courtesy of the United States Bureau of Mines, the results of analyses made for it on 2 samples of crude oil, by 4 different methods, by M. C. Whitaker, a consulting industrial and engineering chemist, were obtained, and also detailed results of each analysis made by the Bureau of Mines' chemists on 20 samples of Healdton oil.

The resultant averages of these 20 tests, as compiled by the Bureau of Mines, is presented in the following table, together with the returns from 15 other analyses. In the 4 tests made by G. Y. Williams the lubricating possibilities of the crude were not determined; in the 8 tests made by M. C. Whitaker the naphtha and illuminating oil were first removed and the residue was separated into lubricating oil and coke; in 3 tests, the two tests made by C. K. Francis and the Bureau of Mines' average based on 20 tests, the heavier contents were classed as lubricating oil and residue; and in a test by L. Kirschbraun the heavy end was divided into lubricating oil, gas oil, and residue.

It should be noted that all of the above-mentioned products were not "finished" to meet commercial standards. The loss in "finishing" the naphtha, gasoline, and kerosene would probably be small, and that in finishing certain lubricants relatively large. For gas oil and residuum, there would be no loss in percentage, but probably some gain, as the residues from the finishing processes of the lighter oils and the lubricants could be turned into the gas and fuel oil.

The following table shows the results of the various laboratory distilling flask tests:

[a] Transcript of Corporation Commission hearing, State Exhibit, Allen No. 1.

TABLE 2.—LABORATORY DISTILLING FLASK ANALYSES MADE TO DETERMINE THE REFINING QUALITIES OF HEALDTON CRUDE OIL.[a]

Test made by—	Where test was made.	Date.	Quantity tested.	Gravity of crude oil.	Sulphur content of crude oil by weight.	Paraffin content by weight.	Asphalt content by weight.
G. Y. Williams:		1914.	*C. c.* [b]	*Deg. B.*	*Per cent.*	*Per cent.*	*Per cent.*
No. 1	Norman, Okla.	Apr. 12	100	31.80	0.66	0.67	0.71
No. 2	do.	do.	100	31.80	.55	.67	.70
No. 3	Oklahoma City, Okla.	May 1	100	.....	.72	.....	.....
No. 4	do.	do.	500	.....	.73	.....	.....
C. K. Francis:							
No. 1	Stillwater, Okla.	Mar. 23	300–500	33.70	.....	.....	(c)
No. 2	do.	do.	300–500	30.40	.....	.....	(c)
L. Kirschbraun	Chicago, Ill.	Apr. 18	.....	31.80	.....	.....	.....
M. C. Whitaker:							
Sample 1470—							
No. 1[d]	New York, N. Y.	June 5	100	30.30	.....	.....	.....
No. 2[e]	do.	do.	100	30.30	.....	.....	.....
No. 3[f]	do.	do.	100	30.30	.....	.....	.....
No. 4[g]	do.	do.	100	30.30	.....	.....	.....
Sample 1464—							
No. 1[d]	do.	do.	100	32.75	.....	.....	.....
No. 2[e]	do.	do.	100	32.75	.....	.....	.....
No. 3[f]	do.	do.	100	32.75	.....	.....	.....
No. 4[g]	do.	do.	100	32.75	.....	.....	.....
U. S. Bureau of Mines' average of 20 tests.	Pittsburgh, Pa.	.....	.....	31.57	.70	(h)	(c)

[a] All results are based on the percentages by volume.
[b] 100 c. c. equals 3.38 fluid ounces.
[c] Presence of asphalt stated in testimony, but amount not given.
[d] Engler method.
[e] Ubbelohde method.
[f] Regnault method.
[g] Nawratil method.
[h] From the lubricating distillates from 8.5 to 1.5 per cent of paraffin wax can be obtained. (Testimony of I. C. Allen at Corporation Commission hearing of June 9, 1914.)

TABLE 2.—LABORATORY DISTILLING FLASK ANALYSES MADE TO DETERMINE THE REFINING QUALITIES OF HEALDTON CRUDE OIL—Continued.

Test made by—	Product.						
	Naphtha.		Gasoline.		Kerosene.		Total naphtha, gasoline, and kerosene.
	Gravity.	Per cent.	Gravity.	Per cent.	Gravity.	Per cent.	
G. Y. Williams:	*Deg. B.*		*Deg. B.*		*Deg. B.*		*Per cent.*
No. 1	.....	.....	62.4	12.0	42.0	35.0	47.0
No. 2	.....	.....	62.4	11.7	42.0	34.6	46.3
No. 3	.....	.....	62.4	12.9	42.0	34.0	46.9
No. 4	.....	.....	62.4	11.6	42.0	34.5	46.1
C. K. Francis:							
No. 1	.....	.....	61.6	14.5	[a]41.9	40.8	55.3
No. 2	.....	.....	54.6	10.3	[a]39.1	32.0	42.3
L. Kirschbraun	.....	.....	64.9	15.0	42.2	25.0	40.0
M. C. Whitaker:							
Sample 1470—							
No. 1[b]	57.5	9.3	.....	.....	41.4	32.7	42.0
No. 2[c]	57.0	5.2	.....	.....	43.6	32.3	37.5
No. 3[d]	57.7	3.7	.....	.....	43.7	34.8	38.5
No. 4[e]	55.3	2.8	.....	.....	44.2	34.0	36.8
Samp 1464—							
No. 1[b]	60.2	16.7	.....	.....	40.5	28.3	45.0
No. 2[c]	62.7	11.5	.....	.....	43.3	30.8	42.3
No. 3[d]	62.1	9.5	.....	.....	43.3	31.2	40.7
No. 4[e]	59.9	11.1	.....	.....	43.2	30.2	41.3
U. S. Bureau of Mines' average of 20 tests	.....	.....	57.7	7.0	42.2	30.7	37.7

[a] Weighted average. Original table shows kerosene fraction, 44.8 gravity, 27.5 per cent; illuminating oils, 36.0 gravity, 13.3 per cent for test No. 1. Kerosene fraction, 40.0 gravity, 25.0 per cent; illuminating oils, 36.1 gravity, 7.0 per cent for test No. 2.
[b] Engler method.
[c] Ubbelohde method.
[d] Regnault method.
[e] Nawratil method.

TABLE 2.—LABORATORY DISTILLING FLASK ANALYSES MADE TO DETERMINE THE REFINING QUALITIES OF HEALDTON CRUDE OIL—Continued.

Test made by—	Product—Continued.								
	Gas oil.		Lubricating oils.		Residuum.		Coke.	Loss.	Total.
	Gravity.	Per cent.	Gravity.	Per cent.	Gravity.	Per cent.			
G. Y. Williams:	*Deg. B.*		*Deg. B.*		*Deg. B.*		*Pr. ct.*	*Pr. ct.*	*Pr. ct.*
No. 1	.....	.....	.....	.....	32.5	48.0	5.0	(a)	100
No. 2	.....	.....	.....	.....	32.5	48.2	5.5	(a)	100
No. 3	.....	.....	.....	.....	32.5	47.0	6.1	(a)	100
No. 4	.....	.....	.....	.....	20.4	53.9	.....	(b)	100
C. K. Francis:									
No. 1	.....	.....	35.0	7.0	20.2	37.2	.....	0.5	100
No. 2	.....	.....	34.2	16.0	20.6	41.7	.....	.0	100
L. Kirschbraun	32.7	15.0	26.4	12.5	15.2	32.5	.....	(b)	100
M. C. Whitaker:									
Sample 1470—									
No. 1 [c]	.....	.....	28.0	52.9	.....	.....	3.5	1.6	100
No. 2 [d]	.....	.....	29.1	56.0	.....	.....	4.8	1.7	100
No. 3 [e]	.....	.....	29.8	56.0	.....	.....	3.9	1.6	100
No. 4 [f]	.....	.....	29.1	57.5	.....	.....	4.0	1.7	100
Sample 1464—									
No. 1 [c]	.....	.....	27.7	50.5	.....	.....	2.6	1.9	100
No. 2 [d]	.....	.....	28.7	53.5	.....	.....	3.1	1.1	100
No. 3 [e]	.....	.....	29.2	53.5	.....	.....	2.7	3.1	100
No. 4 [f]	.....	.....	30.8	52.5	.....	.....	4.8	1.4	100
U. S. Bureau of Mines' average of 20 tests	.....	.....	29.9	29.4	.....	32.9	.....	(b)	100

[a] Loss included in coke.
[b] Loss included in residuum
[c] Engler method.
[d] Ubbelohde method.
[e] Regnault method.
[f] Nawratil method.

All of the records of tests appearing in the foregoing table are from samples taken from single wells, except in the case of the United States Bureau of Mines, which is the average of 20 samples, taken with the special view of securing a representative test of the field. All of the tests, except those made by and for the Bureau of Mines, were made on behalf of the producers. It will be observed that there are wide variations between the results of these tests. This is partly due to the differences in chemical composition of the samples tested, the method used in testing, and the aim of the person making the test to produce the largest proportions of certain products, at the expense of other possible products. That the differences were partly due to chemical composition of the samples is indicated by the different Baumé tests of the crude analyzed.

The gravity of the crude tested varied from 30.3° to 33.7° B. scale. As has already been stated (see p. 20), the average gravity of the crude oil, as it leaves the field for Texas, is 31.6°, and when run by the Corsicana refinery, is 31.36° B. This closely corresponds with the Bureau of Mines' average of 20 samples taken fresh from the wells, which was 31.57°. These differences in gravity of the samples tested account in part for the differences shown in the total content of naphtha, gasoline, and kerosene, which varied from 36.8 per cent to 55.3 per cent. It seems probable, however, that most of the differences found in this respect were due to the method used and the manipulation of the apparatus by the persons making the tests, in order to produce more of certain products at the expense of others which were not desired.

The differences due to method are best shown by the elaborate tests made by M. C. Whitaker, who used four different methods for each sample tested. The following extract from his report is in point:[a]

A comparison of the results obtained shows a wide discrepancy in amounts of the various products obtained by the several methods of analysis, and this difference is especially great in the case of the "naphtha." On sample No. 1464 about one and three-fourths times as much "naphtha" is obtained by the Engler method as by the Regnault method, whereas in sample No. 1470 the "naphtha" obtained by the Nawratil method is less than one-third that obtained by the Engler method. The variations shown in the analysis of your oils by the different methods are directly in accord with our previous experience, extending over a number of years. We do not consider any of the existing methods as dependable. It is doubtful if any of these methods will give results even approximating those attained in practical distillation. We frequently encounter disputes between producer and refiner as to the proper evaluation of an oil due to a difference in results obtained by different methods of analysis. We have frequently urged, and still urge, that the whole question of crude oil analysis and method of valuation be subjected to the most thorough investigation with a view to establishing a standard method of analysis and report.

[a] For full report, see Exhibit 9, p. 103.

The results of the tests made by the Bureau of Mines on 20 samples are those which deserve the most weight. According to the testimony of Irving C. Allen, petroleum chemist of the Bureau of Mines, the aim of the Bureau of Mines is to use a standard method for testing all kinds of crude oils. The following extract from the record of the Oklahoma Corporation Commission hearing on June 9 shows this:[a]

Dr. ALLEN. * * * What the Bureau of Mines is trying to do is to get the products out of the oil without decomposition, without degradation of the product. And with our method of distilling we use an electric still. We distill off all the oil, including the lubricants or a greater part of the lubricants, without cracking the crude at all. With these other methods we can get a much higher yield of gasoline by cracking the contents of the still and sacrificing the lubricating oil.

Q. But the general results from all methods and any method that you might use will arrive at comparative value of the different oils.—A. The method we use, we try to standardize it so we can have it absolutely under control. We say these products are gotten from the crude without decomposition of the oil in any way. You might say it is the natural product of the oil, and those, of course, can be varied at the will of the operator.

Commissioner HENSHAW:

Q. Now, he can increase the amount of the gasoline and decrease the amount of the kerosene.—A. Yes, sir.

Q. Or vice versa?—A. Certainly, it is quite the common practice to run for the markets only.

At the time Mr. Allen submitted the tables showing the results of the Bureau of Mines' tests, he also furnished the following statement in regard to the tests:[b]

The percentages of distillates from laboratory determinations may be made to vary greatly, depending on the method used in the analysis. Although laboratory determinations are not comparable with refinery runs, they are useful for purposes of comparing oils of different origin and from different fields, and they enable an analyist thoroughly informed on the details and principles of any particular laboratory method of analysis and having a knowledge of refining practices, to determine the value of an oil for refining purposes.

If it be desired to re-run the above naphthas for gasoline, the above percentages of gasoline can be thereby increased from five to ten per cent.

The quantity and quality of the other products also can be materially changed by re-running [re-distilling] the respective distillates, and a great variety of products may be produced therefrom.

From the above lubricating distillates, from 8.5 to 1.5 per cent of paraffine wax can be obtained.

From the above residues, there can be obtained by vacuum and steam treatment an additional quantity of heavy lubricant.

In short, the above tests would lead one to believe that first class refined products can be economically produced from the Healdton oils.

[a] Transcript of Corporation Commission hearing, pp. 9 and 10.
[b] Transcript of Corporation Commission hearing, State Exhibit, Allen No. 1.

It is evident from Mr. Allen's testimony that the refining value of a crude oil, as measured by a standard method applicable to all kinds of crudes, may not indicate the commercial value of a particular crude for refining purposes based on the market values of the different products procured from it. The importance of this distinction is seen from the fact, already stated, that lubricants are manufactured from only a small proportion of the crude oil capable of furnishing lubricants which is refined west of the Mississippi River. The market conditions thus far have favored the production of gasoline, illuminating oil, and fuel oil, and even some refineries equipped to make lubricants refine, for that purpose, only a small proportion of the available residues of the crude oil which they run.

THE LABORATORY BARREL-STILL TESTS.—In the barrel-still test the crude oil is distilled in a miniature still under conditions more like those of refining on a commercial scale than are obtainable through the distilling-flask method. The quantity of oil run in some barrel-still tests has been as high as 50 gallons, while that used in the distilling flasks usually is from 100 to 500 cubic centimeters (from 3.38 to 16.9 fluid ounces). The larger quantities of the resultant products secured with the barrel-still facilitates the "finishing" of the products of the first distillation into refined products meeting definite commercial standards. Because of the close approximation of the results shown by barrel-still tests to those obtainable in actual refining on a commercial basis, this method is often used by refiners. All of the barrel-still tests for which the Bureau of Corporations was able to secure records were made at refineries by practical refiners. In six of them no attempt was made to carry the testing process further than the extraction of the naphtha and kerosene, the residue being classed as fuel oil. In four of them the process followed gave gas oil; and in two, engine oil lubricating stock was obtained, although no further attempt was made to produce commercial engine oils. One test was carried to the point of securing cylinder oil of commercial grade, and in another test commercial engine oils were made. The following table shows the results of the various barrel-still tests:

TABLE 3.—LABORATORY BARREL-STILL TESTS MADE TO DETERMINE THE REFINING QUALITIES OF HEALDTON CRUDE OIL.

Test made by—	Where test was made.	Date.	Quantity tested.	Gravity of crude oil.	Sulphur content by weight.				
					Crude oil.	Naphtha.	Kerosene.	Gas oil.	Fuel oil.
		1914.		Deg. B.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
Cosden & Co.	Tulsa, Okla.	April	1 bbl.	31.7	.....	.....	.....	.....	.....
Oklahoma Refinery Co.:									
No. 1	Oklahoma City, Okla.	do	50 gal.	30.5	.....	.....	.....	.....	.....
No. 2	do	do	50 gal.	34.0	.....	.....	.....	.....	.....
Magnolia Petroleum Co.:									
No. 1	Corsicana, Tex.	Feb. 25.	1 bbl.	29.1	.....	.....	.....	.....	.....
No. 2	Beaumont, Tex.	Mar. 15.	40 gal.	33.2	0.660	0.031	[a] 0.155	.....	0.926
No. 3	do	Mar. 17.	12 gal.	30.9	.714	.040	[b] .161	.....	.900
No. 4	do	July	45 gal.	30.6	.638	.....	.161	0.385	.696
No. 5	do	do	1 bbl.	30.6	.....	.....	.....	.....	.....
Sun Co.:									
No. 1 [c]	Toledo, Ohio.	.....	1 bbl.	31.4	.....	.....	.....	.....	.....
No. 2 [d]	do	.....	1 bbl.	31.4	.....	.....	.....	.....	.....

Test made by—	Products.						
	Naphtha.		Gasoline.		Kerosene.		Total naphtha, gasoline, and kerosene.
	Gravity.	Per cent.	Gravity.	Per cent.	Gravity.	Per cent.	
	Deg. B.		Deg. B.		Deg. B.		Per cent.
Cosden & Co.	58.2	[e] 16.1	.....	.....	42.7	20.5	36.6
Oklahoma Refinery Co.:							
No. 1	53.0	7.5	.....	.....	41.0	22.5	30.0
No. 2	55.0	17.5	.....	.....	41.5	22.5	40.0
Magnolia Petroleum Co.:							
No. 1	51.2	5.0	.....	.....	41.3	25.0	30.0
No. 2	66.6	10.0	.....	.....	[a] 46.2	25.0	35.0
No. 3	59.4	5.0	.....	.....	[b] 45.3	25.0	30.0
No. 4	.....	.....	.....	.....	43.7	13.3	13.3
No. 5	58.1	7.5	.....	.....	43.4	25.0	32.5
Sun Co.:							
No. 1 [c]	.....	12.0	.....	.....	.....	15.0	27.0
No. 2 [d]	54.0	10.0	61.0	5.0	45.0	15.0	30.0

[a] Weighted average. Original returns show water-white oil, 45.7 gravity, 15 per cent, 0.146 sulphur; common oil, 46.9 gravity, 10 per cent, 0.169 sulphur.
[b] Weighted average. Original returns show water-white oil, 44.5 gravity, 15 per cent, 0.155 sulphur; common oil, 46.4 gravity, 10 per cent, 0.170 sulphur.
[c] Steam-still test.
[d] Dry-heat test.
[e] Returned as "benzine."

TABLE 3.—LABORATORY BARREL-STILL TESTS MADE TO DETERMINE THE REFINING QUALITIES OF HEALDTON CRUDE OIL—Continued.

Test made by—	Products—Continued.									
	Gas oil.		Fuel oil.		Engine oil lubricating stock.	Cylinder oil stock.	Wax tailing.	Coke.	Loss.	Total.
	Gravity.	Per cent.	Gravity.	Per cent.						
	Deg. B.		Deg. B.		Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
Cosden & Co.	.....	.....	23.0	[a] 60.9	.....	.....	.....	.....	2.50	100
Oklahoma Refinery Co.:										
No. 1	.....	.....	26.0	[b] 70.0	.....	.....	.....	.....	(b)	100
No. 2	.....	.....	26.0	57.5	.....	.....	.....	.....	2.50	100
Magnolia Petroleum Co.:										
No. 1	.....	.....	.....	[b] 70.0	.....	.....	.....	.....	(b)	100
No. 2	.....	.....	24.0	63.0	.....	.....	.....	.....	2.00	100
No. 3	.....	.....	24.1	68.0	.....	.....	.....	.....	2.00	100
No. 4	36.0	13.3	28.1	[c] 20.0	.....	20.0	.....	.....	33.40	100
No. 5	35.9	27.5	.....	.....	30.0	.....	2.5	4.72	2.78	100
Sun Co.:										
No. 1 [d]	.....	[e] 25.0	.....	[f] 10.0	35.0	.....	.....	.....	3.00	100
No. 2 [g]	.....	[e] 30.0	.....	.....	35.0	.....	.....	.....	5.00	100

[a] Returned as "residuum."
[b] Loss included in fuel-oil percentage.
[c] Returned as "nondescript" oil fit only for fuel.
[d] Steam-still test.
[e] Called gas or fuel oil.
[f] Called road or fuel oil.
[g] Dry-heat test.

In the above tests, as in the laboratory distilling-flask analyses of Healdton crude (see Table 2), there were important differences in the gravity of the samples, the highest gravity being 34.0° and the lowest 29.1° B. scale. Furthermore, there were differences in the results obtained, due to the fact that some of the tests were made by the "topping" method—i. e., to secure naphtha, gasoline, kerosene and fuel oil—while other tests were made with the view of also ascertaining the lubricant possibilities. As for the tests shown in Table 2, all of the products were not carried to a finished commercial form.

The total naphtha, gasoline, and kerosene contents varied in the distilling-flask tests (Table 2) from 36.8 per cent to 55.3 per cent, while in the barrel-still tests (Table 3) they varied from 13.3 per cent to 40.0 per cent of the volume of the crude tested. In the results from the distilling-flask tests 12 of the 16 (counting the Bureau of Mines' average of 20 samples as only one test) showed a content of 40 per cent and over. In the results from the barrel-still tests, 7 of the 10 showed a content of under 33 per cent. The results of regular commercial refinery operations, shown below in Table 4 (see p. 36), showed a total naphtha, gasoline, and kerosene content for 886,254 barrels, refined by the Magnolia Petroleum Co. at its Corsicana, Tex.,

refinery, to be 29.8 per cent. The results from the barrel-tests of the Healdton crude were in closer conformity with those of actual refinery operations than were the distilling-flask analyses.

THE REFINERY RUNS.—At the Corporation Commission hearing of June 9 Irving C. Allen, of the Bureau of Mines, testified at some length concerning the reason for the wide discrepancies found between the results of laboratory distilling-flask analyses of Healdton crude made by different chemists, due to the lack of uniformity in their methods of making the tests. The following extracts from the record of the hearings bear on the subject:[a]

Q. A more satisfactory analysis of oil then is really a distillery run, is it?—A. That is the only thing that is of real value. The laboratory methods, though not comparable with the refinery run, give the express analysis, and if the analyst is also familiar with the refinery methods a very close analysis of what that oil will do, but the average analyst is not a refinery man. Now with these very greatly varying results it will probably enlighten you somewhat on the very great disagreement among the various analysts on this Healdton oil. Professor M. C. Whitaker made an analysis for us last week, he ran four different methods. He said it was just as much right to run one as the other and he varied 30 to 90 per cent.

Later, when cross-examined by counsel for the Magnolia Pipe Line Co., Mr. Allen stated:[b]

Q. Mr. Allen in making these tests you used the same kind of still and the same temperatures for the different oils?—A. Yes, sir, exactly the same method, being very careful to get the temperatures exactly the same. Everything is standardized as much as we can make it.

Q. Have you ever had any practical experience as a refiner?—A. No, sir. I have been through a great many of them and talked to a great many refiners.

Q. But you say the refiners can make about the same difference that the small laboratory tests can?—A. They do make the same difference. I notice in the reports here published in the papers in regard to this hearing that the gasoline varies very greatly. It seems to be the only thing they are thinking of.

In this testimony Mr. Allen touches on the reason why the results of a refinery run when considered from a strictly scientific standpoint can not be accepted as conclusive determination of the relative refining quality of a given crude oil, when compared with other crude oils. The refiner adopts that particular refining process for use with any given crude oil which he believes will pay him best, taking into consideration the chemical composition of the oil, the character of the equipment of his refinery, and the values of the different products which can be obtained from it in the markets which are available to him. In the selection of those products which he endeavors to get from the given crude he is guided somewhat by

[a] Transcript of Corporation Commission hearing, p. 9.
[b] Transcript of Corporation Commission hearing, p. 11.

the expense of the process needed to secure them and somewhat by the availability of other crudes, from which the same products can be obtained, but in different proportions and at a different cost.

The commercial value of a particular crude, to a refiner, is dependent on all of the foregoing factors. The actual returns of refinery runs, made subject to such conditions, in a well-equipped and well-managed refinery, afford the best and most practical means for judging the commercial value of a given crude in the market to which it is practicable to transport it. It is for this reason that great weight should be placed on the results of the regular refinery runs made of Healdton crude by the Corsicana refinery of the Magnolia Petroleum Co. The Bureau has carefully verified from the records of this company the information regarding refinery runs which appears in this report. It has carefully examined the refinery-run records and those of the various tests made on the crude oil and the finished products, and has in many instances traced the sales of the products into the hands of bona fide consumers.

A refinery-test run of Healdton crude oil was made on May 12 and 13 at the Coalton, Okla., refinery of the C. D. Webster Oil Co., under the personal supervision of Guy Y. Williams, of the department of chemistry, University of Oklahoma, and C. D. Webster. The quantity refined was 1,972.6 gallons (46.97 barrels). The Bureau obtained from Mr. Williams a copy of his report on this test which he made to Governor Cruce, of Oklahoma, and from Mr. Webster a copy of his report on the test which he sent to Wirt Franklin. Both Mr. Williams and Mr. Webster called attention to the fact that the tank car in which the crude oil arrived at the refinery was unsealed and the lid practically off, and that probably there had been a loss by volatilization of the lighter constituents of the crude while in transit.

The Magnolia Petroleum Co. made three test runs at its Corsicana refinery to determine the refining qualities of Healdton crude. The first test run consisted of 5,512 barrels and was made on April 3. The second consisted of 3,500 barrels and was made on April 17. In the first two tests the crude was finished into marketable products. The third test of 3,460 barrels was made on May 14. The test was not carried through to the point of finishing the products into marketable shape.

In order to show the difference between the results of the two refinery tests of April 3 and May 14, the following statement has been prepared. It shows for the April 3 test the yields previous to finishing the products, so that they are comparable with those of the May 14 test run.

	April 3.		May 14.	
	Barrels.	Per cent.	Barrels.	Per cent.
Crude naphtha	553	10.0	510	14.7
Refined distillate	1,024	18.6	569	16.4
Fuel	3,845	69.8	2,324	67.2
Loss	90	1.6	57	1.7
Total	5,512	100.0	3,460	100.0

In the foregoing comparison may be found an illustration of the point of Mr. Allen's remarks in his testimony quoted on page 32, where he stated that refiners could make the same differences with respect to the results obtained, in the case of refinery runs, as could be obtained in making small laboratory tests. The gravity of the crude used in the April 3 test was 31.5° B.; that of the crude used in the May 14 test was not given. The average gravity of the Healdton crude refined at the Corsicana refinery during the month of May was 31.4° B., which probably is practically the same as that of the crude used in the test run. The differences in the results obtained, since the gravity of the crude used was about the same, must therefore be attributed to the difference in the method used in refining. Not only was the total naphtha and refined distillate content in the May 14 test (31.1 per cent of the total volume of crude refined) higher than that in the April 3 test (28.6 per cent), but the naphtha content, which is more valuable than the refined distillate, was 14.7 per cent in the May 14 test and 10 per cent in the April 3. Notwithstanding the more valuable results obtainable by the method used in the May 14 test, it would not be profitable. On this point, speaking of the May 14 test, W. H. Hastings, superintendent of the Corsicana refinery, stated:

> This test is not on commercial lines. The first steaming, which is not usual, is responsible for an unusually large per cent of stove distillate. This steaming would not be profitable in practice.

The experience of both the Magnolia Petroleum Co. and the Pierce-Fordyce Oil Association is that it is not practicable in running for commercial purposes to refine Healdton crude by itself. In order to get the gasoline and kerosene contents that will meet commercial requirements, it has been found necessary to "sweeten" it with a small proportion of the high-grade crudes. The Magnolia Petroleum Co., at their Corsicana refinery, used Electra and light Corsicana crudes for this purpose, and the Pierce-Fordyce Oil Association used Cushing crude.

The Magnolia Petroleum Co., during the period April 1 to September 30, inclusive, refined a total of 959,372 barrels of crude oil, of which 886,254 barrels were Healdton crude and 73,118 barrels were Electra and Corsicana crudes. The records of the refinery were kept in such a manner that it was possible to secure a separate statement of the yields from Healdton crude, apart from those of the other crudes refined during that period.

In the case of the Pierce-Fordyce Oil Association it was not possible to secure a statement of the yield derived from Healdton crude separately. Furthermore, in the contract between the Pierce-Fordyce Oil Association and the Magnolia Petroleum Co., the Pierce-Fordyce Oil Association had the option of turning back to the Magnolia Petroleum Co. at the same price that it paid for the crude oil (75 cents per barrel), the fuel oil which it derived from refining the crude, after removing naphtha and refined oil distillates amounting to not less than 20 per cent nor more than 30 per cent of the volume of the crude. It is probably because of the terms of the contract, which enabled the Pierce-Fordyce Oil Association to take off, if it so chose, not less than 20 per cent of the volume of the crude that the results of refining 364,729 barrels, of which 335,259 barrels were Healdton crude, 23,906 barrels were Cushing crude, and 5,564 barrels were rerun distillate (source of crude not stated), show 79.4 per cent of the total yield as fuel oil.

The inclusion of the Cushing crude gives a larger proportion of naphtha, gasoline, and kerosene than would be the case if the yield of the Healdton crude could be obtained separately. On the other hand, the terms of the contract were favorable to the running of a larger proportion of the crude into fuel oil than otherwise would have been the case. The Bureau has no means of judging how far these two causes, one tending to increase and the other to diminish the proportion of naphtha, gasoline, and kerosene in the resultant yield, offset each other. Since the Pierce-Fordyce Oil Association had the option of turning into distillate 30 per cent of the volume of the Healdton crude, if it so desired, it is probable that, under the then existing market conditions, the company found it more profitable to limit itself to taking only about 20 per cent.

The following table presents the results of three refinery-test runs, and the results of the regular refinery operations of the Magnolia Petroleum Co. and Pierce-Fordyce Oil Association.

TABLE 4.—RESULTS OF REFINERY TESTS AND REGULAR REFINING OPERATIONS USING HEALDTON CRUDE OIL.

Run made by—	Where test or run was made.	Date.	Quantity run.	Crude oil, gravity.	Product.			
					Naphtha.		Gasoline.	
					Gravity.	Per cent.	Gravity.	Per cent.
		1914.	*Barrels.*	*Deg. B.*	*Deg. B.*		*Deg. B.*	
C. D. Webster Oil Co.	Coalton, Okla.	May 12-13.	47	32.00	.....	.....	56.9	12.3
Magnolia Petroleum Co.:								
No. 1	Corsicana, Tex.	Apr. 3.	5,512	31.50	62.4	[a] 7.3	.....	.....
No. 2	do	Apr. 17.	3,500	.....	61.3	9.6	.....	.....
No. 3	do	Apr.-Sept.	886,254	31.36	56.3	2.9	64.0	5.3
Pierce-Fordyce Oil Association.	Fort Worth, Tex.	Aug.-Sept.	[b] 364,729	.....	.....	1.9	.....	8.6

Run made by—	Product—Continued.						
	Kerosene.		Total naphtha, gasoline, and kerosene.	Fuel oil.		Loss.	Total.
	Gravity.	Per cent.		Gravity.	Per cent.		
	Deg. B.		*Per cent.*	*Deg. B.*		*Per cent.*	*Per cent.*
C. D. Webster Oil Co.	44.0	30.6	42.8	24.0	[c] 57.2	(c)	100
Magnolia Petroleum Co:							
No. 1	44.9	20.9	28.2	23.6	69.8	2.0	100
No. 2	[d] 42.7	25.8	35.4	23.1	62.6	2.0	100
No. 3	43.3	21.6	29.8	.....	68.7	1.5	100
Pierce-Fordyce Oil Association	.....	9.7	20.2	.....	79.4	.4	100

[a] Original records show 4.1 per cent engine naphtha, 57.4° B. test; 3.2 per cent D. S. gasoline, 69° B. test.
[b] Includes 91.9 per cent Healdton crude, 6.6 per cent Cushing crude, and 1.5 per cent of rerun distillate; origin of crude not stated.
[c] Loss included in fuel-oil percentage.
[d] Weighted average. Original records show 6.5 per cent W. W. 120° fire test, 45.5° B. test; 19.3 per cent S. W. 112° fire test, 41.8° B. test.

Although in the case of the first test some of the lighter constituents of the crude oil may have been reduced through evaporation, while the crude oil was in transit from the Healdton field to the Coalton refinery, because the lid was off the car, the gravity shown at the time of the refinery run, 32.0° B., is higher than that shown for any of the other tests, and for the regular refinery operations. No gravity was shown for the test run made by the Magnolia Petroleum Co., but it was probably about 31.5° B., which was the average gravity of the crude refined at the Corsicana refinery during the month of April.

Some of the differences in the proportion of the lighter products can be accounted for by the differences in the gravities of the finished naphtha and gasoline, as larger proportion of low gravity than of

high gravity product can be obtained. It should be noted, however, that there was a wide difference between the total naphtha, gasoline, and kerosene content of the different tests, that of April 3 test of the Magnolia Petroleum Co. showing 28.2 per cent; of the April 17 test showing 35.4 per cent; and of the Webster test, 42.8 per cent. The test of April 3, of the Magnolia Petroleum Co., corresponds most closely with the actual results from the refinery of 886,254 barrels, from April to September, inclusive, as will be noted by the following comparison:

Product.	Test of Apr. 3, 1914.		Refinery run April to September, 1914.	
	Per cent.	Baumé test.	Per cent.	Baumé test.
		Degrees.		*Degrees.*
Naphtha	4.1	57.4	2.9	56.3
Gasoline	3.2	69.0	5.3	64.0
Kerosene	20.9	44.9	21.6	43.3
Fuel oil	69.8	23.6	68.7	.....
Loss	2.0	.....	1.5	.....
Total	100.0	.....	100.0	.....

On account of the facts already stated concerning the conditions under which the Pierce-Fordyce Oil Association operated, the Bureau does not consider the actual refinery-run results obtained by the Pierce-Fordyce Oil Association refinery as valuable as those of the Magnolia Petroleum Co. for the determination of the yields to be obtained from refining Healdton crude under the usual commercial conditions. The six months' experience of the Magnolia Petroleum Co.'s refinery is the most authoritative information on the subject.

A comparison of the results of the six months' refinery operations of the Corsicana refinery of the Magnolia Petroleum Co. with the results of the distilling-flask tests shown in Table 2 and the barrel-still tests shown in Table 3 shows that every distilling-flask test indicated a higher total content of naphtha, gasoline, and kerosene for the crude than was borne out in the actual refining experience. The lowest per cent of these products shown in such tests was 36.8 per cent, the highest 55.3 per cent, 12 of the 16 showing over 40 per cent, while the refinery runs for six months on 886,254 barrels showed but 29.8 per cent. In the case of the barrel-still tests, a comparison between them and the Corsicana refinery run shows a much closer correspondence. Of the 10 tests, 6 showed a total naphtha, gasoline, and kerosene content between 27 and 33 per cent, and the remaining 4 showed 30 per cent, which is approximately the proportion obtained by the refinery.

Section 4. The manufacture of lubricants from Healdton crude oil.

It has been claimed in support of the contention that Healdton crude oil has valuable refining qualities, that lubricants can be manufactured from it. The contention of the Magnolia company's refiners on this point is, that while it is possible to manufacture good engine oils, it is not profitable to do so, due to the fact that other crudes are better adapted for the purpose.

The opinion of Mr. Allen, based on the results of the United States Bureau of Mines' tests, on the lubricating values has already been quoted. (See p. 28.) He was cross-examined by counsel for the Magnolia Pipe Line Co. on the refining difficulties resulting from the presence of asphaltum in Healdton crude, as follows:[a]

Q. Now did you test the Healdton oil for asphaltum?—A. No, sir, we didn't separate the asphaltum, but it is very small. It has a considerable portion of paraffine, crystallizable paraffine. We separated out some nice crystal paraffine very closely resembling the Pennsylvania.

Q. You don't know how much asphaltum?—A. No, sir.

Q. It interferes with the lubricants if it is in considerable quantities?—A. Yes, sir, though the California oils have been worked for lubricants and it is very fine.

Q. Profitably?—A. Yes, sir.

The testimony of Mr. Williams at the Corporation Commission hearing of May 1 to 6, when cross-examined by counsel for the Magnolia Pipe Line Co. in regard to this subject, was as follows:[b]

Q. You find, I notice, quite a lot of asphalt present?—A. 0.7 per cent. That is not large.

Q. Well do you know whether from a practical standpoint the heavier qualities of this oil could be used to manufacture lubricants in view of the asphalt that is in it?—A. Well I don't want to testify on that. I am just testifying to that analysis and the correctness of it and what there is there.

A similar cross-examination of Mr. Francis brought out the following testimony:[c]

Q. Did you make any test as to whether or not lubricating oils could be manufactured from this?—A. Yes, sir.

Q. What was your test?—A. Why I made a distillation carrying it down together and obtained a certain amount of lubricating oil having the properties of lubricating oil. Tested it with machinery, upon a machine I have there at the college.

Q. Well, did that lubricating oil that you found have asphaltum in it?—A. Yes——I beg your pardon.

Q. I mean was the asphaltum in this crude oil?—A. Yes, sir.

Q. Do you know what difficulty there would be in treating it to make lubricating oil due to the fact that there is asphaltum in it?—A. Well it would not be as practical as a paraffine base oil to make lubricating oil. That is, it could not be made as cheaply.

[a] Transcript of Corporation Commission hearing, p. 11.
[b] Transcript of Corporation Commission hearing, p. 90.
[c] Transcript of Corporation Commission hearing, pp. 143–144.

In discussing with an agent of the Bureau of Corporations the barrel-still tests made by the Sun Co. (see Table 3, p. 30), J. N. Pew, president of the Twin State Oil Co., stated that although the absence of cylinder stock was a drawback, for that was considered to be the most valuable element in any crude, the crude did contain a substantial proportion of other lubricating stock, and also a fair showing of low-grade paraffine. The two barrel-still tests referred to do not show definitely what kinds and quantities of commercial lubricants could be manufactured from the lubricating stock.

A test was made by the Oriental Oil Co., at their refinery in November, 1914, to determine the lubricating qualities of Healdton crude. The test was made on a commercial scale with 24,951 gallons (594.1 barrels) of Healdton crude of 29° B. test, but it was not carried out to the point of securing marketable products from the lubricating stock. The yield obtained was as follows:

	Per cent.		Per cent.
Benzine	9.2	Fuel oil	34.9
Light distillate	18.0	Loss	.8
Heavy distillate	7.9		
Wax distillate	29.2	Total	100.0

The "wax distillate," 29.2 per cent of the volume of the crude, was the lubricating stock. It corresponds with the "paraffine distillate," shown in the Magnolia Petroleum Co.'s barrel-still test (see Exhibit 11, p. 109) and would require similar treatment to that accorded the "paraffine distillate" in that test in order to make commercial engine oils. F. M. Smith, vice president and treasurer of the Oriental Oil Co., stated that he did not consider this test fair or satisfactory, and that he was confident that the oil tested was not fresh oil but had been run from storage. He stated further that his company intended to make a thorough test for lubricating oils, and that he was confident that Healdton crude would prove to be a good oil for the manufacture of lubricants.

Three tests have been made by the Magnolia Petroleum Co. to determine the nature of the commercial lubricants which it is possible to obtain from Healdton crude. The information in regard to the first test was given in E. E. Plumly's testimony at the Corporation Commission hearing of May 1 to 6. He stated that the crude could not be profitably refined for lubricants. Part of his testimony is as follows:[a]

Q. What is the difficulty in the way?—A. Paraffin—or asphalt is the main thing in the way of lubricants. It is a black oil and in order to make a cylinder oil out of it you have got to treat it. We treated a sample, we lost 25 per cent in the treatment and we treated it with 30 pounds of acid to the barrel.

Q. Is that an unusual amount?—A. A very unusual amount, and we lost 25

[a] Transcript of Corporation Commission hearing, pp. 258–259.

per cent of our crude in the treatment that went off with the sludge acid and then we run that for cylinder oil with the results that we got a black sticky mass that could not have been sold anywhere for a lubricant.

Q. Then, as I understand it, the loss you sustained and the expense of treating it and the character of article you get all make it prohibitive to attempt to use it.—A. Certainly would.

He also testified that the Magnolia Petroleum Co. used Electra oil and a heavy oil from Mexico in its manufacture of lubricants, and that it would be possible to use Cushing oil for that purpose.

Later, in the month of July, two barrel-still tests were made at the Beaumont refinery to determine, in a more definite manner, the lubricant quality of Healdton crude. The descriptions of these tests were furnished the Bureau of Corporations. (See Exhibits 10 and 11, pp 107–110.)

The following table shows a comparison of the results from the Oriental Oil Co. refinery-run test with the barrel-still tests of the Magnolia Petroleum Co. and the Sun Co. Since the Oriental Oil Co. and the Sun Co. did not finish up merchantable products, the yield for the Magnolia Petroleum Co.'s test is stated for the corresponding stage in the process. The nomenclature as reported has been retained and corresponding items have been grouped in the table.

TABLE 5.—COMPARISON OF TESTS MADE TO DETERMINE THE LUBRICATING QUALITIES OF HEALDTON CRUDE OIL.

Product.	Oriental Oil Co., refinery run.[a] Volume of crude.	Magnolia Petroleum Co., barrel-still tests.[b]		Sun Co., barrel-still tests.[c]	
		Test for engine oils; volume of crude.	Test for cylinder oils; volume of crude.	Steam-still test; volume of crude.	Dry-heat test; volume of crude.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Benzine	9.2				
Naphtha		7.5		12.0	10.0
Gasoline					5.0
Light distillate	18.0				
Heavy distillate	7.9 (25.9)				
Light end common oil		2.5			
Heavy end common oil		7.5 (25.0)			
Water-white stock		15.0			
Kerosene			13.3	15.0	15.0
Wax distillate	29.2				
Paraffine distillate		30.0			
Lubricating stock				35 0	35.0
Nondescript oil			20.0		
Cylinder oil			20.0		

[a] Baumé test, 29°. [b] Baumé test, 30.6.° [c] Baumé test, 31.4°.

TABLE 5.—COMPARISON OF TESTS MADE TO DETERMINE THE LUBRICATING QUALITIES OF HEALDTON CRUDE OIL—Continued.

Product.	Oriental Oil Co., refinery run; volume of crude.	Magnolia Petroleum Co., barrel-still tests.		Sun Co., barrel-still tests.	
		Test for engine oils; volume of crude.	Test for cylinder oils; volume of crude.	Steam-still test; volume of crude.	Dry-heat test; volume of crude.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fuel oil	34.9				
Road or fuel oil				10.0 (35.0)	
Gas or fuel oil				25.0	30.0
Gas oil distillate		27.5	13.3		
Wax tailings		2.5 (34.7)			
Coke		4.7			
Loss	.8	2.8	33.4	3.0	5.0
Total	100.0	100.0	100.0	100.0	100.0

In the foregoing table the lubricating stock is designated by various names, but these have been grouped so as to afford a ready comparison. The Oriental Oil Co. refinery-run test and the Magnolia Petroleum Co.'s barrel-still test for engine oils show 29.2 per cent and 30.0 per cent, respectively—a very close agreement.

Attention may be called to the United States Bureau of Mines' average of 20 tests (see Table 2, p. 24) made with the laboratory distilling-flask method, which show results in rather close conformity with these two tests. For the sake of comparison, the yields shown by the Bureau of Mines are repeated here: Gravity of crude, 31.57° B.; gasoline, 7.0 per cent; kerosene, 30.7 per cent; lubricants, 29.4 per cent; residuum (including loss), 32.9 per cent. The two Sun Co. tests show lubricating stock amounting to 35 per cent of the volume of the crude, and the Magnolia Petroleum Co. test shows 20 per cent for the cylinder oil and also 20 per cent for "nondescript oil," which apparently should be classed as lubricating stock.

In his letter of August 19, transmitting the results of the barrel-still tests for lubricants,[a] Mr. Greer, the general attorney of the Magnolia interests, stated in regard to the experiment to determine whether or not cylinder oils can, in a practical way, be manufactured from Healdton crude for commercial purposes:

> The sum and substance of this experiment is that it is not practical to use the Healdton crude, rather than other crudes, to manufacture commercial cylinder oils. The following are the leading obstacles and objections in the way:
>
> (*a*) The excessive emulsification;
> (*b*) The excessive use of lye;
> (*c*) The excessive amount of washing necessary;
> (*d*) The great loss (33⅓ per cent) in the treatment of this oil.

[a] Exhibits 10 and 11, pp. 107–110.

You will see that the cylinder oil obtained shows a prohibitive Vis, [viscosity] (411 at 212) and exhibits a color and appearance that would prevent its being a success on the market.

The following table has been prepared to show a comparison of the cost and value of products of Healdton and Electra crudes, when refined to obtain engine oils at the Beaumont refinery. The barrel-still test yields have been used for presenting the Healdton crude values in the absence of any refinery runs carried to the point producing commercial engine oils, and the yields obtained by the experience of actual refinery runs at the Beaumont refinery have been used for presenting the Electra crude values. A regular refinery run of Healdton crude to make engine oils might show slightly different yields from the barrel test. The difference would probably be, however, in decreasing the proportion of lubricants finished up, rather than increasing it.

TABLE 6.—COMPARISON OF THE VALUES OF THE PRODUCTS OF HEALDTON AND ELECTRA CRUDE OIL WHEN REFINED TO PRODUCE ENGINE OILS.

Product.	Healdton crude, barrel-still test.[a]				Electra crude, refinery runs at Beaumont refinery.[b]			
	Volume of crude.	Gallons.	Price per gallon.	Amount.	Volume of crude.	Gallons.	Price per gallon.	Amount.
	Per cent.		*Cents.*		*Per cent.*		*Cents.*	
Naphtha	7.50	3.15	6.62	$0.20853	27.00	11.34	6.62	$0.75071
Refined oil	25.00	10.50	5.01	.52605	30.00	12.60	5.01	.63126
Gas oil	12.32	5.17	4.50	.23265	21.23	8.92	4.50	.40140
Foots oil	.81	.34	4.50	.01530	.....	.....	.....	.....
118/120 M. P. wax	.....	.....	.....	.....	.23	[c] .10	[d] 3.27	.02060
124/126 M. P. wax	.....	.....	.....	.....	.55	[e] .23	[d] 3.32	.04847
128 M. P. wax	.47	[f] .20	[d] 3.32	.04150	.....	.....	.....	.....
Pale oil	12.30	5.17	5.75	.29728	6.12	2.57	5.75	.14778
Red oil	4.10	1.72	6.21	.10681	5.39	2.26	6.21	.14035
Fuel oil	27.50	11.55	1.88	.21714	.....	.....	.....	.....
Wax tailings	2.50	1.05	1.88	.01974	.....	.....	.....	.....
Coke	4.72	[g] 1.98	[d] .25	.03608	6.00	[h] 2.52	[d] .25	.04585
Loss	2.78	1.17	.....	.....	3.48	1.46	.....	.....
Total	100.00	42.00	.....	1.70108	100.00	42.00	.....	2.18642

[a] Baumé test, 30.6°.
[b] Baumé test, 40–41°.
[c] Equals 0.63 pounds.
[d] Price per pound.
[e] Equals 1.46 pounds.
[f] Equals 1.25 pounds.
[g] Equals 14.43 pounds.
[h] Equals 18.34 pounds.

In the above table the price used for naphtha is an average of the gasoline and engine naphtha prices taken from sales on an f. o. b. refinery basis, for the Beaumont refinery, April to September, 1914. The prices of refined oil, finished (M. P.) wax, pale oil, and red oil, respectively, are averages of the prices taken from sales, on an f. o. b. refinery basis for the Beaumont refinery, for the same period. The prices used for gas oil and for fuel oil, respectively, are computed

on sales April to September, 1914, f. o. b. Corsicana refinery basis, no such prices being obtained from the Beaumont refinery records. No prices of sales of foots oil and of wax tailings were obtained, but as the foots oil obtained in refining Electra is run into gas oil, and the wax tailings into fuel oil, the prices of those products were used, respectively. The price for coke was taken from a statement showing prices in April. The gas-oil distillate obtained on the first distillation in the Healdton crude test had so much sulphur that a further treatment would be needed to make it commercial gas oil. It has, therefore, been considered at a fuel-oil price. The total value of the lubricants—that is, the pale oil, red oil, and wax, obtained from a barrel of Healdton crude—is shown in the above table to be $0.44559, and from a barrel of Electra to be $0.35720. It is evident that Healdton crude has lubricant qualities for the manufacture of engine oils. The question is, therefore, one of the practicability of its use for this purpose, in competition with the other crudes also available to the refinery.

In reference to the experiment made for the purpose of seeing if engine oils can be manufactured from Healdton crude, Mr. Greer in his letter of August 19 stated:

This experiment does show that very good engine oils can be made from the Healdton crude, but it is not practical to use it for this purpose, and this circumstance does not add to its value for two reasons:

(*a*) In order to obtain the paraffine distillate from which the engine oils are manufactured you have to cut out the naphtha, the refined oil and the gas oil. You get a small percentage of naphtha and refined oil and the gas oil obtained can not be used commercially as gas oil because of the excessive amount of sulphur present, which would necessitate re-running it into fuel oil.

(*b*) Engine oil can be manufactured from practically all crudes, and there are so many other crudes better adapted to the manufacture of engine oils than the Healdton crude that no one would ever choose Healdton crude for this purpose if he had these other crudes better suited, from which to select. In other words, no value is added to the Healdton crude by reason of the fact that you can make engine oil from it, because of the circumstances above stated.

According to the estimates[a] furnished the Bureau by the Magnolia Petroleum Co., the cost of gathering, storage, and evaporation in the Electra field is 20 cents per barrel, and cost of pipage from Electra to Beaumont is 30 cents. To this must be added the cost of the crude at the wells, the price of which on September 21 was 65 cents. The cost of the Electra crude, f. o. b. Beaumont refinery, was, therefore, on September 21, $1.15 per barrel. The cost of Healdton crude at the Texas State line was 70 cents, the price paid by the Magnolia Petroleum Co. to the Magnolia Pipe Line Co. The distances from both fields to Beaumont are substantially the same.

[a] These estimates were furnished to the Bureau, and while the Bureau has not, for the purposes of this report, determined for itself from an examination of the books of the company the various costs, it is of the opinion that for use in the above comparison of Healdton and Electra crudes, the estimates are sufficiently accurate.

According to the estimate[a] furnished the Bureau by the Magnolia Petroleum Co., the cost of pipage to Beaumont is 25 cents. The cost of the Healdton crude f. o. b., Beaumont refinery was, therefore, 95 cents per barrel. It may be noted that the Magnolia Petroleum Co. in its estimate for cost of transporting crude to Beaumont, admits that the cost is 5 cents more for the Electra than for the Healdton crude. The estimate[a] of the Magnolia Petroleum Co., furnished the Bureau for the cost of refining, not including overhead expense, depreciation, interest, or extraordinary expenses, was $0.1677 per barrel both for Healdton and for Electra crudes. According to an estimate[a] furnished the Bureau by the Magnolia Petroleum Co. (see p. 111), the cost of removing the sulphur from the refined oil and naphtha was $0.003793 per gallon. Applying this estimate to the 3.15 gallons of naphtha and 10.50 gallons of refined oil obtained from the Healdton crude in the barrel-still test, the cost of desulphurizing would be $0.0518, which should be added to the cost of refining Healdton crude. The following table shows a comparison of the relative cost in using the two crudes:

Cost.	Healdton crude, per barrel.	Electra crude, per barrel.
Crude f. o. b. Beaumont refinery	$0.90	$1.15
Refining (exclusive of overhead expense, etc.)	.1677	.1677
Desulphurizing naphtha and refined oil	.0518	.....
Total	$1.1195	$1.3177

A deduction of the above total cost of buying, transporting, and refining a barrel of Healdton crude from the total value of its products when refined for engine oils, as shown in Table 6, leaves a profit of $0.58158 per barrel ($1.70108—$1.1195=$0.58158). A similar computation for the Electra crude shows a profit of $0.86872 ($2.18642—$1.3177=$0.86872). This gives a difference in favor of Electra of $0.28714.

On the basis of the prices used in Table 6, which in general are averages of sales made in the six months' period, April to September, 1914, inclusive, the foregoing computations show that when the price of Electra crude at the wells was 35 cents higher than that of Healdton, as it was from March 26 to May 5, there was a greater profit by $0.08714 a barrel in refining Electra crude for engine oils than Healdton crude. From May 5 to September 30 the difference in the

[a] These estimates were furnished to the Bureau, and while the Bureau has not, for the purposes of this report, determined for itself from an examination of the books of the company the various costs, it is of the opinion that for use in the above comparison of Healdton and Electra crudes, the estimates are sufficiently accurate.

prices of the two crudes at the wells has been 25 cents or less, making it more profitable to use Electra crude for the manufacture of engine oils, as shown above.

Section 5. The presence of sulphur in Healdton crude oil.

The commercial significance of the presence of sulphur in the Healdton crude is a matter of dispute. It is maintained by some experts who have made tests on the oil that the sulphur present could easily and inexpensively be removed in the process of refining. On the other hand, it is the contention of the Magnolia Petroleum Co., which has refined large quantities of Healdton crude, that the sulphur is present in a fixed form, which requires more expensive processes for its removal to bring the products within commercial specifications than is the case with other competitive crudes, and that because of this fact it is expedient to remove only enough of the lighter products to bring the residue down to the required "flash" test and sell it for fuel oil.

The earliest mention of the presence of sulphur in the Healdton oil which the Bureau of Corporations has found is in the report of H. L. Wood to the Oklahoma Corporation Commission on March 13.[a] In this report Mr. Wood said:

> There is very perceptible sulphur odor noticeable over the field, like the heavy crudes produced in Texas, Louisiana, Mexico and California—the so-called fuel oils of commerce, a few of the wells showing lighter gravities give off a sweet odor like most of the regular refining crudes.

Statements of those who maintain that the sulphur is easily removable are as follows:

Irving C. Allen, petroleum chemist of the United States Bureau of Mines, testified before the Oklahoma Corporation Commission on June 9, 1914, in regard to various analyses made of Oklahoma crude oils by the Bureau of Mines. In reply to a question as to whether 0.7 of 1 per cent, which he stated he had found in his analyses of 20 samples of Healdton crude, was an excessive amount of sulphur, he answered:[b]

> No, sir it is not. I think this sulphur can be removed very satisfactorily in the ordinary commercial stills of commerce.

C. D. Webster, an oil refiner of considerable experience, testified at the Corporation Commission hearing of May 1 to 6 on the subject of the refining quality of Healdton oil. At that time Mr. Webster had made no test himself of the Healdton crude, but based his opinions on the laboratory analyses which had been submitted to

[a] See Exhibit 2, p. 94.
[b] Transcript of Corporation Commission hearing, p. 6.

the commission. When questioned as to what he meant by his statement that he didn't think the presence of sulphur in such amounts as were shown by the analyses ought to make very much depression commercially in the price of the crude oil, he answered:[a]

> The price [cost] of eliminating that oil—the sulphur doesn't remain in the kerosene or in the gasoline. Those are the two that they get the value out of. Now what remains in the fuel oil that doesn't make any difference.
>
> Q. It smells bad enough any way?—A. Yes sir, it is just a matter of smell.

A refinery run was made on May 12 and 13 at C. D. Webster's refinery at Coalton, Okla., to test the refining qualities of the Healdton crude, on which occasion 1,972.6 gallons (46.97 barrels) were run through the still. (See Table 4, p. 36.) This run was given the personal supervision of Guy Y. Williams, of the department of chemistry, University of Oklahoma, and C. D. Webster. In his report of June 1, 1914, to Governor Cruce, Mr. Williams stated in reference to sulphur:

> The naphtha fraction gave slight tests for sulphur; the kerosene fraction showed stronger tests for sulphur. From the chemical standpoint I see no reason why this oil cannot be treated so as to remove the sulphur from the first two fractions, if their removal is necessary. This can be done by either the "Litharge process" or the "Frasch process."

Mr. Webster furnished the Bureau of Corporations with a copy of his report to Wirt Franklin, president of the Crystal Oil Co., concerning this same run. In regard to sulphur he stated:

> The sulphur in the oil was a little more than we are getting out of the Schulter oil but not enough to interfere with its refining and we used only the same methods as we are using on all of our crude oils from this field.

At the Corporation Commission hearing of May 1 to 6, Mr. Williams testified that he had made four tests of the Healdton crude oil for sulphur, and found 0.66 per cent, 0.55 per cent, 0.72 per cent, and 0.73 per cent, respectively, making an average of 0.66 per cent. Charles K. Francis, chief chemist of the Oklahoma Agricultural and Mechanical College at Stillwater, Okla., testified that he had tested the Healdton crude oil for sulphur and found "practically 0.77 of 1 per cent." Both Messrs. Williams and Francis stated that they had not tested for sulphur content the naphtha or illuminating oil obtained in their laboratory distillation of the crude.[b]

The proportion of sulphur existing in Healdton crude, as found by the foregoing experts, is in close correspondence with that claimed by the Magnolia Petroleum Co., as a result of their own tests. Since Messrs. Francis and Williams did not make a sulphur test of the products obtained by their laboratory distillation, and Messrs. Williams and Webster did not state in their reports on the refinery run the exact proportions of sulphur obtained in the naphtha, kerosene, and residue, there are no definite figures to compare with those secured from the Magnolia Petroleum Co.

[a] Transcript of Corporation Commission hearing, p. 117.
[b] Transcript of Corporation Commission hearing, pp. 87, 88, 113 ,132, 133, 143.

In discussing with an agent of the Bureau of Corporations the result of two barrel-still tests made by the Sun Co. (see Table 3, p. 30), J. N. Pew, jr., president of the Twin State Oil Co., stated that Healdton crude contains from one-half of 1 per cent to 1 per cent of sulphur, but that this, however, could not affect the value of the oil to more than 1 cent per barrel at the most.

When questioned by an agent of the Bureau in regard to the difficulty in removing sulphur from the refined products of Healdton crude, L. Mooney, superintendent of the Pierce-Fordyce Oil Association's Fort Worth refinery, stated that a somewhat larger amount of chemicals is required in the treatment of Healdton distillate than for Electra or Cushing distillate. He further said that the removal of the sulphur from the Healdton crude is not a serious problem for a refiner. The increased cost due to the use of more chemicals is not great.

On the other hand, the contention that the sulphur is not easily removable is strongly insisted on by representatives of the Magnolia interests. At the Corporation Commission hearing on May 1 to 6, E. E. Plumly, manager of the refinery department of the Magnolia Petroleum Co., testified as to the reason why the first test did not reveal the presence of sulphur in such form as to affect the value of the crude. He said:[a]

> The reason we didn't find the sulphur in this first test was due to the fact that all Texas and Oklahoma oils we had come in contact with before had showed such a small per cent of sulphur that it was not in our way and that was the reason this sulphur test was not made on this first sample.

In describing the circumstances concerning the discovery of the sulphur difficulty he testified that the second sample of Healdton oil was received on March 14, and was at once tested on a one-barrel still. The company had at that time inquiries for a British Admiralty oil and wished to find out whether the residuum from Healdton, after taking out the light product, would answer the purpose. The sulphur test for certain of the British Admiralty specifications permits the presence of sulphur up to 0.75 of 1 per cent. The test of the Healdton residuum showed a sulphur content of about 0.92 of 1 per cent. Tests for sulphur were thereupon made on the crude oil; also on the lighter products. The crude showed 0.66 of 1 per cent, the naphtha 0.041 of 1 per cent, and the illuminating oil 0.196 of 1 per cent. The commercial specifications for naphtha permit only 0.01 of

[a] Transcript of Corporation Commission hearing, p. 255.

1 per cent, 0.04 of 1 per cent for water-white oil (first-grade kerosene), and 0.06 of 1 per cent for common oil (second-grade kerosene). Mr. Plumly testified, in regard to the difficulty of removing the sulphur, as follows:[a]

A. We found it very difficult to remove; the sulphur is of a fixed nature different from other sulphur oils that are found in south Texas. The sulphur on the south Texas oils will pass off in the gas, but the sulphur on this oil will not pass off in the gas and we have found a way to remove it on a trial by treating the distillates with ten pounds of sulphuric acid and taking them all back for re-distillation and treating the products distilled off the second time with a second 10 pounds of sulphuric acid we barely got the refined oils down to a point where they would just meet the specifications.

Q. Is the process in removing this sulphur from the lighter product more expensive than the process you have to resort to in the use of the Electra and the Cushing and other light oils obtainable?—A. Yes, sir, it is very much more.

Q. While you can remove it the process of doing so is more expensive?—A. It is about double the cost.

A letter, dated March 23, from E. E. Plumly to E. R. Brown, the general manager of the Magnolia Petroleum Co., was put in the record of the Corporation Commission hearing (defendant's Exhibit No. 5). It shows the result of the test and the importance attached by Mr. Plumly to the character of the sulphur. (See Exhibit 5, p. 100.) Telegrams which passed between Mr. Brown and H. C. Folger, jr., of New York, who, with John D. Archbold, at that time owned about 70 per cent of the stock of the Magnolia Petroleum Co. and also of the Magnolia Pipe Line Co., indicate the importance attached by them to the matter. (See Exhibit 6, p. 102.) On the basis of their claim that the sulphur found in the Healdton crude is of such a nature as to be difficult of elimination in refining, the Magnolia Pipe Line Co., on March 26, reduced the price of oil of 32° and over from $1.05 to $0.70, making the same price for all oil from the Healdton field regardless of gravity test.[b]

At the request of the Bureau, E. E. Plumly, manager of the refinery department of the Magnolia Petroleum Co., prepared a statement showing the cost of desulphurizing the naphtha and refined oil obtained from Healdton crude in order to bring them to commercial specifications.[c] He estimated the cost of desulphurizing to be $0.003793 per gallon of refined oil and naphtha. On the basis of the yields obtained by the Corsicana refinery in refining 886,254 barrels from April to September, 1914, inclusive, the cost per barrel would be $0.0475 per barrel of crude (12.516, the number of gallons of naphtha, gasoline, and kerosene, multiplied by $0.003793 equals

[a] Transcript of Corporation Commission hearing, pp. 257–258.

[b] E. R. Brown in his affidavit (see Exhibit 5, p. 100) also referred to the low average gravity of the crude as one of the reasons for this action. The Bureau's examination of the statements made publicly at the time of reduction show that the chief reason put forward by the pipe line company was the presence of sulphur.

[c] See Exhibit 12, p. 111.

$0.0475). In a letter to the Bureau concerning this statement, Mr. Plumly pointed out that, with one exception all of the basic figures used in his statement were derived directly from the regular monthly yield and cost statements of the refinery. Concerning the one exception, he wrote:

The estimated cost of handling the 917,190 gallons of refined oil pumped to Beaumont, re-run and treated again, was obtained from costs of re-running and treating like amounts of refined oil, but on account of mixing other oils with the refined oil re-run and not keeping the finished products separate, we have nothing on our regular records to show this cost.

The foregoing evidence shows that the expense of desulphurizing the naphtha, gasoline, and kerosene derived from Healdton crude, together with the impracticability of obtaining gas oil from this crude and the fact that the fuel oil contains a relatively high per cent of sulphur in comparison with that from crude from other fields, would not, of itself, affect the value of Healdton crude by more than 5 cents a barrel. While the difference of 35 cents in the price per barrel between Healdton and the other crudes, which was made on March 26, may have been justified by other reasons, it certainly was not justified primarily because of the sulphur content of the Healdton crude.

Section 6. Comparative value of products of Healdton and other Oklahoma crude oils.

Results of United States Bureau of Mines' analyses.—As already stated, the tests of the different crude oils obtained by the Bureau of Mines were made by a standard method. The object was to determine what products could be obtained from the crude without destructive distillation, i. e., without decomposition of the oil in any way. (See p. 28.)

In the following table the prices are based upon the f. o. b. refinery prices of the Magnolia Petroleum Co., which were verified by agents of the Bureau. The naphtha prices are an average of the gasoline and engine naphtha prices taken from sales on an f. o. b. refinery basis for the Beaumont refinery, April to September, 1914. The prices for kerosene are an average for the six months, April to September, 1914, inclusive, April, May, and September being Corsicana prices and June, July, and August, Beaumont prices. The fuel-oil prices are an average of prices f. o. b. refinery at Corsicana, Tex., based upon contracts of April, May, June, and July, 1914, for present and future delivery. In the absence of any actual prices on unfinished lubricating distillate, the price used in computing values on this product is an estimated value, being slightly more than one-half a cent per gallon higher than the price of fuel oil. Whatever varia-

tion from the actual values this might result in, it is so small as to be negligible. It should be borne in mind that the figures for the first three yield statements, which are based upon the tests made by the United States Bureau of Mines, represent only what might be expected from the products resulting from the first process of distillation. There would be some change in the quantity and quality of commercial products finished from the first distillates, but probably it would be so slight as not to affect the validity of the figures for purposes of comparison with each other.

TABLE 7.—COMPARATIVE VALUE OF PRODUCTS OF HEALDTON, AVERAGE OKLAHOMA AND CUSHING CRUDE OILS, BASED UPON LABORATORY ANALYSES OF THE UNITED STATES BUREAU OF MINES (1 BARREL OF 42 GALLONS OF CRUDE OIL).

Crude oil and product.	Gravity.	Per cent yield.	Gallons.	Price per gallon.	Amount.
Healdton crude:[a]	*Deg. B.*				
Naphtha	57.7	6.0	2.520	$0.06621	$0.16685
Kerosene	42.2	28.8	12.096	.04796	.58012
Lubricants	29.9	29.7	12.474	.02500	.31185
Residue, fuel oil	.....	34.4	14.448	.01875	.27090
Loss	.....	1.1	.462	.....	.....
Total	.....	100.0	42.000	.....	1.32972
Average Oklahoma crude:[b]					
Naphtha	59.6	8.1	3.402	.06621	.22525
Kerosene	42.2	38.5	16.170	.04796	.77551
Lubricants	29.1	26.1	10.962	.02500	.27405
Residue, fuel oil	.....	26.5	11.130	.01875	.20869
Loss	.....	.8	.336	.....	.....
Total	.....	100.0	42.000	.....	1.48350
Cushing crude:[c]					
Naphtha	58.5	25.8	10.836	.06621	.71745
Kerosene	42.3	32.0	13.440	.04796	.64458
Lubricants	29.5	23.2	9.744	.02500	.24360
Residue, fuel oil	.....	17.5	7.350	.01875	.13781
Loss	.....	1.5	.630	.....	.....
Total	.....	100.0	42.000	.....	1.74344

[a] Average of 20 wells; gravity of crude, 31.57° B.

[b] Average of 133 wells in 31 different pools, not including the Healdton or Cushing deep-sand crudes; gravity of crude, 33.96° B.

[c] Composite of 6 samples of Cushing deep-sand crude; gravity of crude, 40.94° B.

It will be seen by the foregoing table that the value of the products from a barrel of Healdton crude, according to the yields shown by the Bureau of Mines' tests, was $0.15378 below that from the average Oklahoma crude, and $0.41372 below that from Cushing crude. Expressed in percentages, the value of Healdton crude, judged by the value of its products, would be 90 per cent of that of average Oklahoma crude and 76 per cent of that of Cushing crude.

The difference in the value of the products is accounted for largely by the difference in the gravity of the crude oils. In this respect the influence of the high-grade Cushing crude is especially noticeable, the proportion of naphtha being more than three times larger than for the average Oklahoma crude and more than four times greater than for the Healdton crude. From the results based upon the analysis of the United States Bureau of Mines it is quite clear that the Healdton crude is less valuable than either the average Oklahoma or the Cushing crudes. At the hearing before the Oklahoma Corporation Commission June 9, 1914, Irving C. Allen, petroleum chemist of the United States Bureau of Mines, was questioned concerning the relative value of Cushing, average Oklahoma, and Healdton crude oils, as compared with the best Pennsylvania crude oil, in the following manner:[a]

Q. I believe you stated in the beginning that in your judgment from such investigations you have made that the deep sand oil in the Cushing field was in value 90 per cent of the Pennsylvania high-grade oil and that the Healdton oil was 90 per cent of the value of the average oil of Oklahoma. Now in this average oil of Oklahoma, did that include the Healdton field or the deep sand field oil?—A. No, sir. I can state very briefly: The Pennsylvania oil is value 100 per cent, Bartlesville sand 90 per cent, Oklahoma in general 85 per cent and Healdton 75 per cent.

Q. That would make the Healdton field, as compared with Pennsylvania 75 per cent.—A. 75 per cent of the Pennsylvania.

Q. And 90 per cent of the value of the average Oklahoma oil?—A. No, Oklahoma oil is about 85, 15 per cent less than the Pennsylvania.

Q. Yes, I understand it is 15 per cent less than the Pennsylvania and the Healdton oil would be 10 per cent less than the average Oklahoma oil.—A. Yes, sir. There should not be a greater difference than 25 per cent in the value of the Healdton and Pennsylvania. That is at the well, of course.

Q. Now then the Bartlesville sand oil alone, what would you say is the difference between that and the Pennsylvania oil?—A. About 10 per cent.

Q. That would be 100, 90, 85 and 75?—A. Yes, sir.

RESULTS FROM REFINERY RUNS.—The Bureau, in the following table, presents a statement of the comparative value of various Oklahoma, north Texas, and north Louisiana crudes. The yields shown were obtained in actual refinery runs made for commercial purposes, and the prices used are the same as those in the foregoing table. As has been already pointed out, it is possible, by various changes in the processes, for the refinery to vary, within certain limits, the character and proportions of the refined products from a given crude, and, for this reason, a direct comparison of refinery runs, where the markets supplied are different, does not afford a final definite means for exact judgment of the commercial values of different crudes. (See p. 32.) Since the runs made at refineries located in Oklahoma and Kansas were made with reference to market conditions for refined products differing in some particulars from

[a] Transcript of Corporation Commission hearing, pp. 13–14.

the conditions in Texas, that fact should be taken into consideration. For example, recently fuel oil has commanded a lower price f. o. b. refinery in Oklahoma than f. o. b. refinery in northern Texas, the region where the bulk of the Healdton crude is marketed. It is possible that, had the price of fuel oil been higher in Oklahoma, a greater proportion of the crude would have been run to that product. Notwithstanding the fact that this table does not furnish the means for arriving at a judgment, theoretically exact, of the commercial values of the different crudes, based on the value of the products obtainable from them, it does, however, present an approximately correct statement. The table shows near enough for practical purposes the commercial refinery possibilities of the different crudes.

TABLE 8.—COMPARATIVE VALUE OF HEALDTON, CUSHING, GLENN POOL, AND AVERAGE OKLAHOMA, LIGHT CORSICANA, AND ELECTRA (TEX.), AND MANSFIELD (LA.) CRUDE OILS, AS DETERMINED BY REGULAR REFINERY OPERATIONS (BASED UPON 1 BARREL OF 42 GALLONS OF CRUDE).

Crude oil and product.	Run.	Per cent yield.	Gallons.	Price per gallon.	Amount.
Healdton crude:					
Gasoline	a 1	5.32	2.23	$0.07081	$0.15791
Engine naphtha		2.86	1.20	.05766	.06919
Kerosene		21.64	9.09	.04796	.43596
Fuel oil		68.66	28.84	.01875	.54075
Loss		1.52	.64		
Total		100.00	42.00		1.20381
Healdton-Cushing crude:					
Gasoline	b 2	8.62	3.62	.07081	.25633
Engine naphtha		1.88	.79	.05766	.04555
Kerosene		9.67	4.06	.04796	.19472
Fuel oil		79.39	33.34	.01875	.62513
Loss		.44	.19		
Total		100.00	42.00		1.12173
Light Corsicana crude:					
Gasoline	a 3	18.00	7.56	.07081	.53532
Kerosene		34.57	14.52	.04796	.69638
Gas oil		14.01	5.88	.04500	.26460
Fuel oil		31.42	13.20	.01875	.24750
Loss		2.00	.84		
Total		100.00	42.00		1.74380
Electra crude:					
Gasoline	a 4	27.06	11.37	.07081	.80511
Kerosene		27.91	11.72	.04796	.56209
Gas oil		14.53	6.10	.04500	.27450
Fuel oil		28.50	11.97	.01875	.22444
Loss		2.00	.84		
Total		100.00	42.00		1.86614

a Yields shown by refinery runs at the Corsicana refinery of the Magnolia Petroleum Co.
b Yields shown by refinery runs at the Fort Worth refinery of the Pierce-Fordyce Oil Association.

TABLE 8.—COMPARATIVE VALUE OF HEALDTON, CUSHING, GLENN POOL, AND AVERAGE OKLAHOMA, LIGHT CORSICANA, AND ELECTRA (TEX.), AND MANSFIELD (LA.) CRUDE OILS, AS DETERMINED BY REGULAR REFINERY OPERATIONS (BASED UPON 1 BARREL OF 42 GALLONS OF CRUDE)—Continued.

Crude oil and product.	Run.	Per cent yield.	Gallons.	Price per gallon.	Amount.
Electra crude:					
Gasoline	a 5	22.89	9.61	$0.07081	$0.68048
Engine naphtha		2.81	1.18	.05766	.06804
Kerosene		25.87	10.87	.04796	.52133
Gas oil		9.33	3.92	.04500	.17640
Fuel oil		36.77	15.44	.01875	.28950
Loss		2.33	.98		
Total		100.00	42.00		1.73575
Mansfield crude:					
Gasoline	b 6	10.00	4.20	.07081	.29740
Kerosene		55.00	23.10	.04796	1.10788
Gas oil		20.00	8.40	.04500	.37800
Fuel oil		13.00	5.46	.01875	.10238
Loss		2.00	.84		
Total		100.00	42.00		1.88566
Glenn pool crude:					
Gasoline	c 7	17.69	7.43	.07081	.52612
Kerosene		17.28	7.26	.04796	.34819
Fuel oil		60.64	25.47	.01875	.47756
Loss		4.39	1.84		
Total		100.00	42.00		1.35187
Cushing crude:					
Gasoline	c 8	30.90	12.98	.07081	.91911
Kerosene		25.00	10.50	.04796	.50358
Gas oil		15.00	6.30	.04500	.28350
Fuel oil		27.00	11.34	.01875	.21263
Loss		2.10	.88		
Total		100.00	42.00		1.91882
Average Oklahoma crude:					
Gasoline	c 9	19.52	8.20	.07081	.58064
Kerosene		18.13	7.61	.04796	.36498
Gas oil		2.41	1.01	.04500	.04545
Fuel oil		58.33	24.50	.01875	.45938
Loss		1.61	.68		
Total		100.00	42.00		1.45045

a Yields shown by refinery runs at the Fort Worth refinery of the Pierce-Fordyce Oil Association.
b Yields shown by refinery runs at the Beaumont refinery of the Magnolia Petroleum Co.
c Yields shown by refinery runs at refineries located in Oklahoma and Kansas.

The average prices per gallon in the preceding table are the same as those shown in Table 7 (p. 50), except that the gasoline prices are an average of the f. o. b. refinery, Beaumont, Tex., for April to September, 1914, inclusive. The engine naphtha prices are an average f. o. b. for the same plant for May to September, 1914, inclusive. The gas-oil prices are based upon the only price data available, namely, for May and August, 1914, f. o. b. Corsicana, Tex.

The foregoing comparison of the value of the products of the different crude oils, on a percentage basis, shows that the total value of the products from a barrel of Healdton crude (No. 1) is 69 per cent of light Corsicana crude (No. 3); 65 per cent of Electra crude, as refined by the Magnolia Petroleum Co. (No. 4), and 69 per cent, as refined by the Pierce-Fordyce Oil Association (No. 5); 64 per cent of Mansfield crude; 89 per cent of Glenn pool crude; 63 per cent of Cushing crude; and 83 per cent of average Oklahoma crude (including some Cushing crude). Since the run of Healdton-Cushing crude by the Pierce-Fordyce Oil Association (No. 2) is not to be considered typical of results that would be obtained under normal refining conditions, no comparison with them is made. (See p. 35.)

Attention should be called to the fact that comparisons based on Tables 7 and 8, are on the total market value of the products obtainable from the same quantities of the different crudes. They do not represent the relative profit which the refinery obtains by refining the different crudes. The relative profit depends not only on the relative yields to be obtained from different crudes, refined for a common market, but also on the relative costs, f. o. b. refinery basis, of these crudes as well as the relative cost of refining them. The margin shown after the deduction of these relative costs from the total value of the derived products, does indicate the relative profit to the refinery from the use of one crude as compared with another.

In the absence of any satisfactory determination of the cost of transportation of crude oil from the wells to the refinery and of the relative cost of refining, the Bureau does not attempt to state definitely the actual profit to be derived from refining the various crudes. The crude oil prices, shown in Table 9, on page 55, are those paid at the wells, and do not represent prices of crude oil delivered at the refinery.

Section 7. Comparison of crude-oil prices in the Mid-Continent field for March to September, 1914, inclusive.

The following table gives a comparison of the price paid for the crude oil produced in different parts of what is known as the Mid-Continent oil field, which embraces Kansas, Oklahoma, northern Texas, and northern Louisiana. It will be noted that on March 1,

1914, except in the case of Healdton crude, which was $1.03, the posted price of all the other crudes was the same ($1.05). Following the cut in the price of Healdton crude on March 26, there was a marked decline in the price paid for all the other crudes, excepting the Caddo crude.

TABLE 9.—PRICE OF DIFFERENT KINDS OF MID-CONTINENT CRUDE OIL AT WELLS, MAR. 1, 1914, TO SEPT. 30, 1914 (PER BARREL OF 42 GALLONS).

[Prices from the Oil and Gas Journal.]

Date.	Healdton, Okla.	All other Oklahoma crude.[a]	Electra, Tex.[a]	Light Corsicana, Tex.	Light Caddo, La.[b]
March 1	[c] $1.03	$1.05	$1.05	$1.05	$1.05
March 2	[d] .70-[e]1.03	1.05	1.05	1.05	1.05
March 9	[d] .70-[e]1.05	1.05	1.05	1.05	1.05
March 26	[a].70	1.05	1.05	1.05	1.05
April 8	[a].70	1.00	1.05	1.05	1.05
April 10	[a].70	.95	1.05	1.05	1.05
April 13	[a].60	.90	.95	.95	1.05
April 15	[a].60	.85	.95	.95	1.05
April 20	[a].50	.85	.85	.85	1.05
April 27	[a].50	.80	.85	.85	1.05
April 30	[a].50	.75	.85	.85	1.05
May 5	[a].50	.75	.75	.75	1.05
July 9	[a].50	.75	.75	.75	1.00
August 8	[a].50	.75	.75	.75	.95
August 13	[a].50	.75	.75	.75	.85
September 1	[a].50	.75	.75	.75	.80
September 12	[a].50	.65	.75	.75	.80
September 21	[a].50	.55	.75	.75	.80
September 22	[a].50	.55	.65	.65	.80
September 30	[a].50	.55	.65	.65	.80

[a] Regardless of gravity.
[b] In the absence of quotations on Mansfield crude, the price of Caddo, La., crude above 38° gravity, which is the same as paid for Mansfield crude, is used in this table.
[c] This is the price posted by the Magnolia Pipe Line Co. on January 26. (See p. 10.)
[d] For crude under 32° gravity.
[e] For crude 32° gravity and above.

From the foregoing table it will be seen that in the period March 1 to September 30, 1914, the decline in the prices of crude oil at the wells was general in the Mid-Continent field (including northern Texas and Louisiana), but the decline was not uniform for the different crudes. In the case of Healdton crude the decline from $1.05 to 50 cents per barrel took place in about a month and a half, while in the case of the other crudes the reduction in price was much more gradual.

Section 8. Comparison of the prices of refined products with that of Healdton crude oil.

The Senate resolution calls for information as to "whether corresponding changes have been made in the prices of the finished products manufactured from such oil."

At the time the resolution was passed none of the Healdton crude oil had been refined on a commercial scale, and consequently there were no finished products to sell. Since the latter part of April, however, a large quantity of Healdton crude has been refined and the finished product sold. Comparison of f. o. b. refinery prices for the markets supplied by the Magnolia Petroleum Co., however, shows that, excepting for gasoline and fuel oil, immediately following the reduction in the price of Healdton crude from $1.05 to $0.70 per barrel there was no perceptible reduction in the price of finished products. Between April and September, 1914, the price of gasoline at the Magnolia Petroleum Co.'s Beaumont refinery declined $0.0218 per gallon, or 24 per cent, and the price of fuel oil f. o. b. Corsicana fell off $0.45 per barrel, or 40 per cent. On the other hand, the price of kerosene at the Corsicana refinery advanced $0.0086 per gallon. This was equivalent to about 20 per cent. The reduction in the price of Healdton crude from $1.05 to $0.50 per barrel, which price has been effective since April 20, 1914, was equivalent to 52 per cent.

It should be pointed out in this connection that the market prices of the finished products from crude oil at any particular time are determined by several factors, one of which is the price of crude oil at the wells. The other factors deal with other elements of supply, such as transportation of the crude, refining, and marketing costs and the possibility of competition through use of substitutes or supplies from other sources, and of demand, such as the consumption requirements of the available market. Furthermore, since similar products, though in different proportions, can be finished from most crude oils, the decrease in price of the crude from one field, which at that time furnished only a relatively small proportion of the total crude oil consumed by the refineries which supplied the north Texas market, would not be likely to influence to a perceptible extent the market prices of the finished products.

Theoretically, a reduction in the price of the crude oil would, other things being equal, bring about some reduction in the prices of the finished products. The reduction in the price of crude must, however, in order to bring about such a reduction in the prices of products, affect a considerable proportion of the crude which is refined.

Section 9. The Bureau of Corporations' conclusion relative to the cause of the price reductions.

After an examination of all the evidence on the subject that it has been able to secure, the conclusion of the Bureau is that the Magnolia Pipe Line Co. from January 26, 1914, when it began to buy and run oil into its pipe-line system, in the Healdton field, up to November, 1914, had a monopoly of the only practical means of transporting the oil from the field to a refinery market. It did not transport any oil as a common carrier. The lack of marketing facilities and the charges for transportation were such that the producers preferred to sell their oil at the wells to the pipe line company, and no oil was offered for transportation.

The pipe line company bought all the oil entering its pipe line, stored it, transported it to the boundary line between Oklahoma and Texas, and sold it to the Magnolia Petroleum Co., an allied concern. The Magnolia Pipe Line Co., by virtue of the circumstances which made it the only purchaser, as well as transporter of the oil produced in the field, in fixing the price which it would pay for the oil, at the same time fixed the market price for the oil produced in the field.

With respect to the cause of the reductions in the price fixed by the Magnolia Pipe Line Co., the Bureau finds no evidence of an intent to arbitrarily depress land values in order to buy oil-producing property more cheaply, or to acquire stocks of oil already accumulated at a price much below its real value. It is true that officials of the Magnolia Petroleum Co. early in the development of the Healdton field made exceedingly favorable statements in regard to the refining quality of the oil, and said it was a high-grade oil. They assert that this was a bona fide mistake, and the evidence of the correspondence in the files of the Magnolia Pipe Line Co. and the Magnolia Petroleum Co. as well as their actions support this contention. When they discovered that only a relatively small proportion of gasoline and kerosene could be obtained from it, that the oil did not have enough lubricating value to make it practicable for them to use it for the manufacture of lubricants, and that it had a relatively high percentage of fixed sulphur, to remove which increased the cost of refining, the Magnolia Pipe Line Co. made the various reductions in price. This was done, they claim, in order to put the f. o. b. refinery cost of the crude oil from the Healdton field on a competitive basis with the similar cost of the crudes from other fields that were available to the Magnolia Petroleum Co.'s refineries.

The Bureau of Corporations finds that the contention of the pipe line company regarding the small gasoline and kerosene content of

the crude oil produced in the Healdton field is correct. It is of the opinion also that while Healdton crude is chemically adapted to the manufacture of lubricants yet in view of the prices at which other crudes better adapted to the manufacture of lubricants could be bought, and the limited market for the lubricants obtainable from Healdton crude, its lubricant qualities added little to its market value. The fixed sulphur which is in the Healdton crude is removable from the gasoline and kerosene by methods which are not unduly expensive, although more expensive than is necessary for other competing crudes. The sulphur, however, does not affect the value of the Healdton crude enough to justify any important reduction in the price paid for the oil. In brief, the conclusions of the Bureau are that the reductions in the price of Healdton crude oil were made because of the discovery by the Magnolia Pipe Line Co. of its small gasoline and kerosene content, and because the lubricating values of this crude were not enough to warrant, under existing conditions, its use for the manufacture of lubricants.

The pipe line company, however, does not appear to be without blame for its failure to determine the true character of the oil at an early date. This would have saved much disappointment to producers.

In regard to the question raised in the Senate resolution whether changes were made in the prices of the finished products manufactured from Healdton crude oil corresponding to the changes in the price of the crude, it should be noted that no finished products from Healdton crude oil were marketed until about the latter part of April, 1914, at which time all of the reductions in price had taken place.

CHAPTER III.

CHARGES AGAINST THE MAGNOLIA PIPE LINE CO. IN REGARD TO DISCRIMINATION.

Section 1. The legal aspects of discrimination.

The language of the resolution on the subject of discriminations is as follows:

> Whether discriminations are practiced on the part of said company as between different producers of oil in the above mentioned field, and especially as to whether any discrimination is practiced against the oil produced on Indian allotments.

Before the evidence bearing on this subject is considered, it is desirable to examine the Oklahoma law, popularly known as the Yeager-Strain Act, and also the circumstances which led to the necessity, on the part of the pipe line company, of prorating its runs from the producers in the Healdton field, because of its inability to take the entire daily production.

The Yeager-Strain Act, approved March 27, 1909, is set forth in sections 4304–4318 of the Revised Laws of Oklahoma, 1910, chapter 53, Article II, pages 1111–1114. The title of the original act is as follows:

> AN ACT to regulate all corporations, associations and persons engaged, in this State, in the business of carrying crude petroleum, or its products, through pipe lines; to regulate operators of oil wells and refiners of crude petroleum and its products, regulating the purchasing of mineral oil by pipe lines, providing punishments for violations thereof, and declaring an emergency.

The first section defines the different forms of business to which the act applies; the second and third sections confer powers of acquiring rights of way, under certain conditions; the fourth, fifth, and sixth sections deal with the duties as common purchasers and common carriers; the next five sections deal with the formalities which must be complied with in order that the privileges conferred under the act may be enjoyed. The remaining sections deal with the enforcement of the act and the penalties that may be imposed for its violation.

The sections in regard to the duties of common purchasers, common carriers, and penalties, are as follows:

> 4307. *Common purchasers of oil—required to purchase.* Every corporation, joint stock company, partnership or other person, claiming or exercising the right to carry or transport crude oil or petroleum or any of the products thereof, by pipe

line, for hire, or otherwise, within the limits of this State, as allowed by, and upon compliance with the requirements of this article, as owner, lessee, licensee, or by virtue of any other right or claim, which is engaged in the business of purchasing crude oil or petroleum therein, shall be deemed a common purchaser thereof, and shall purchase all of the petroleum in the vicinity of, or which may be reasonably reached by its pipe lines, or gathering branches, without discrimination in favor of one producer or one person as against another, and shall fully perform all the duties of a common purchaser; but if it shall be unable to perform the same, or shall be legally excusable from purchasing and transporting all of the petroleum produced, then it shall purchase and transport petroleum from each person and producer ratably, in proportion to the average daily production; and such common purchasers are hereby expressly prohibited from discriminating in price or amount for like grades of oil, or facilities as between producers or persons; and in the event such purchaser is likewise a producer, it is hereby prohibited from discriminating in favor of its own production, or storage, or production or storage in which it may be interested directly or indirectly in whole or in part, and its own production and storage shall be treated as that of any other person or producer.

4308. *Same—exceptions.* All persons, firms, associations, and corporations are exempt from the provisions of this article where the nature and extent of their business are such that the public needs no use in the same, and the conduct of the same is not a matter of public consequence; and for this purpose the district courts of the State and the corporation commission are vested with jurisdiction to determine such exemptions in any action or proceeding properly before them, as provided in this article.

4309. *Oil carriers are common carriers—discrimination prohibited.* Every corporation, joint stock company, partnership or person engaged in the business of carrying or transporting crude oil or petroleum or any of the products thereof for hire or otherwise, by pipe line, within this State, and by virtue of and in conformity to any valid law incapable of revocation by any law of this State or of the United States, or by virtue of and in conformity to the provisions of this article, shall be deemed a common carrier thereof as at common law; and no such common carrier shall allow or be guilty of any unjust or unlawful discrimination, directly or indirectly, in favor of the carriage, transportation, storage or delivery of any crude, stock or storage oil, or any product thereof, in its possession or control, or in which it may be interested, directly or indirectly.

4315. *Penalty for violations.* Any person, co-partnership, or corporation, its agent or employee, violating any of the provisions of this article, or any order of the competent courts of this State, or the corporation commission, pursuant to the jurisdiction conferred by this article, shall, upon conviction thereof, be fined a sum of not less than one thousand dollars, nor more than five thousand dollars, or imprisonment for not less than six months, nor more than one year, or by both such fine and imprisonment for each and every violation of this article; but in case the monthly runs or takings or transportation of oil shall average so as to be without discrimination, as herein provided, the transactions of any particular day, week, or portion of a month shall be disregarded; and the competent court of the county in which the omission or commission, which is a violation of this article has occurred shall have jurisdiction of an action under the penal code for the punishment thereof; and said penalties shall not be exclusive of civil liability.

4316. *Suspension of penalty, when.* Whenever the operation of a valid order of a competent court or the corporation commission is duly suspended, according to law, the punitive provisions of this article shall likewise be suspended in their operation as to the transactions adjudicated in said court; and, further, any court having jurisdiction of an action brought by the State to punish for a violation under the terms of this article, shall not impose a punishment therefor greater than five hundred dollars against any person or corporation, if it finds from the evidence that the violation was made solely with the object of testing according to law the validity of any of the provisions of this article, or of the order of any competent court or of the corporation commission, in any proceeding to carry out the provisions hereof.

The Magnolia Pipe Line Co., up to November, 1914, had not transported any oil from the field, in its character of common carrier, because, as stated by the general counsel of the company, the producers made no demand for the transportation of oil, and furthermore, because if they had succeeded in working up a market for the crude the pipe line and railroad charges to their nearest available market were such that they could not realize as much from the sale of their oil as the Magnolia Pipe Line Co. would pay them for it at Healdton. Therefore, only the sections relating to the duties of a common purchaser and to the penalties for violation of the act have thus far had much bearing on the situation.

Under the law, the common purchaser must purchase all of the petroleum which may be reasonably reached by its pipe lines, or gathering branches, without discrimination in favor of one producer as against another, and it is further provided that if unable to perform all the duties of a common purchaser or if legally excusable from purchasing and transporting all of the petroleum produced, then the common purchaser shall make his purchases from each producer "ratably, in proportion to the average daily production," and is prohibited from discriminating in price or quantity run for like grades of oil, or in facilities as between producers.

It should be noted that while on conviction of a violation of the act, by discrimination between producers, the pipe line company is heavily penalized, it is provided that in case the monthly runs shall average so as to be without discrimination, the transactions of any particular day, week or portion of a month shall be disregarded. Evidently this provision was inserted because it is not practicable to run the pro rata of every producer each day, which in many cases might amount to only a few barrels. It is preferable to empty a whole tank at one time.

During the study of the question of discrimination raised by the Senate resolution it became evident, from the different interpretations placed on the Yeager-Strain Law by various interested parties, that the actions constituting discrimination needed clearer definition. The following are some of the questions raised concerning which up to this time there has been no judicial determination:

1. Does a pipe line have to purchase, or take proportionately from each producer or lease, oil already held in storage before the pipe line began to act as a common purchaser in a given field?

2. Does a pipe line at a time when it is purchasing the entire production of the field have to purchase more oil than the current production of that field during the period in which it is acting as a common purchaser, even though it is running less oil than its normal daily capacity?

3. Does the fact that a pipe line company does not establish a pro rata system of purchasing oil in the field until a certain date in any way relieve it from liability for discrimination in its purchases from different producers or leases, between the time it began to be a common purchaser in the field and the date on which it established a prorating system?

4. When wells were shut in, at a time when the entire production of the field was being run, because the producer had tanks filled with storage oil, accumulated before the pipe line commenced to purchase in the field, and wished to clear these tanks of such storage oil before increasing his production, is such producer entitled to have runs made from his lease by the pipe line in quantity equal to the actual daily production of his wells, or in quantity equal to their estimated capacity under normal conditions?

5. In computing the daily production of the field is the actual quantity produced from the wells on each lease to be considered, or is their potential capacity as established by estimates or gauges at a time when the well was running freely to be used? In other words, when wells have been shut in or "pinched in" in order to prevent the oil from being accumulated in storage, are such wells to be rated in computing the pro rata entitled to be run from that lease or producer on their potential capacity for production, or on their actual production?

6. Should the prorating be figured for each lease when more than one lease is operated by a producer, or is the producer entitled to have his total pro rata allowance derived from all his leases run from whatever leases he or the pipe line company may elect? What is the answer to this question when diverse royalty interests in the different leases operated by one producer are involved?

Each of the foregoing questions is based on some claim put forward by one or more of the interested parties in the Healdton field. It is obvious, for instance, that if a pipe line company is bound, under the common purchaser clause, to purchase stock or storage oil accumulated on leases before it begins to make any purchases in the field, that its refusal to make such purchases would constitute discrimination against the producer having such "stock" oil. Likewise, in cases where, in order to avoid the expense of providing tanks or earthen storage of sufficient capacity to take care of the largest potential output of his wells, a producer has shut in or

"pinched in" the wells to reduce their output, the question of whether or not there was discrimination by the pipe line company in his case might hinge on the decision as to whether the potential daily capacity of the wells or the actual daily output is the proper basis for computing the quantity of oil which, under the law, the pipe line company is bound to purchase from that producer.

In the absence of any judicial determination of the various points raised, the Bureau of Corporations, in answering the question of discrimination raised in the Senate resolution directing its investigation, has, for the purpose of this report, considered that, during the period from January 26 to March 23, when the pipe line company was purchasing a quantity of oil which closely corresponded to the production of the field during that period, estimated on the basis of pipe line runs and stocks of oil in storage on the leases, the actual output of the wells should be taken, and not the potential capacity. In other words, if a producer, during this period, preferred to restrict the output of his wells, instead of providing the necessary tankage to store it until it was taken by the pipe line company (which has a legal limit of 30 days in which to correct inequalities in running oil from the different producers), the Bureau considers that he was entitled to have run by the pipe line company his actual output, not his potential capacity.

The Bureau considers that after the company gave notice (about March 23) that it was not able to take the entire output of the field, that the potential capacity of the wells, and not the actual output, should be the basis for prorating the oil as between producers. Such a proceeding is in line with the elimination of waste, which would arise from the construction of unnecessary tankage and the deterioration of the oil in storage. After March 23 there existed a situation forced upon the producer by the inability of the pipe line company to take the existing daily production. Before that time the producer curtailed his output merely as an accommodation to his own operations.

Section 2. General discussion of the charges of discrimination.

The output of the discovery well in the Healdton field, brought in August 6, 1913, was rated at 25 barrels a day. According to testimony presented in behalf of the Magnolia Pipe Line Co. at the Corporation Commission hearings, and to other evidence obtained by the Bureau, D. C. Stewart, superintendent of the Magnolia Petroleum Co.'s pipe line department, advocated the building at an early date by the Magnolia interests of two 55,000-barrel steel tanks in which to store the production pending the completion of the pipe line. In spite of some opposition on the part of other officers of

the company, who doubted whether the prospects of the field warranted so large an outlay for storage facilities, Mr. Stewart's project was approved. Pending the construction of these steel storage tanks, the Magnolia Petroleum Co. furnished the material for 1,600-barrel wooden tanks free of charge to the following producers: Humble Oil Co., two tanks; Rex Oil Co., one tank; Crystal Oil Co., two tanks; 1911 Oil Co., two tanks; Dundee Petroleum Co. (successor to the Red River Oil Co.), four tanks. According to D. C. Stewart's statement to the Bureau—

> The Magnolia Petroleum Company furnished tanks delivered at railroad; the producers erected same, with no consideration, and had privilege of buying later on. At the time these tanks were furnished, the Magnolia Pipe Line Company had not been organized. It was done to afford means to test the early wells, and as a temporary accommodation.

The first 55,000-barrel storage tank was completed January 27, 1914, and the second on February 25, 1914. The pipe line was opened for the regular business of transporting oil from Healdton on March 11. At that time the estimated daily production of the field was about 6,300 barrels. The estimated capacity of the pipe line at this time was 10,000 barrels per day.

At the time of the March 13 hearing before the Corporation Commission the subject of the capability of the pipe line to take care of the future output from the field was brought up. The following is from the official record of the hearing. In the course of his remarks, referring to Healdton conditions, George C. Greer, counsel for the pipe line company, said:[a]

> We are going to take care of the field to the full extent that we had planned for. That is, so far as I know, and the manager is here and he tells me so far as he knows that is the plan, 10,000 barrels per day. If the production there exceeds our capacity we are going to follow your law and pro-rate it. If the production is 15,000 barrels and our capacity is 10,000 and we can take 10,000 and pay for it, we can only take as near as we can, ten-fifteenths from every man.

The foregoing is an amplified form of a similar statement which Mr. Greer had previously made at this hearing in connection with the discussion of the quality of the oil. (Transcript of Corporation Commission hearing, p. 8.) The following extract from the hearings also bears upon this subject:[b]

> Mr. GREER. Isn't it true that we are now taking care of the present production?
>
> Mr. MASON. No, sir.
>
> Mr. FRANKLIN. In response to that question, Judge Greer, whether you know it or not or whether it was done by authority, the gaugers sent around by your company notified every company they wouldn't take only a small per cent of their oil thereafter. That notice was given out day-before-yesterday. Doctor Smith has a daily production of a thousand barrels and the gauger told him he wouldn't take more than——
>
> Mr. GREER. If the gauger told him that he didn't know.
>
> Mr. FRANKLIN. The gauger don't take it. It is results we are after.
>
> Mr. GREER. We will take all that is there.
>
> Mr. MASON. That is very pleasant for us to hear that you are going to take it.
>
> Mr. GREER. What you have got now. If you produce too much we can not.

[a] Transcript of Corporation Commission hearing, p. 11.
[b] Transcript of Corporation Commission hearing, pp. 29–30.

Later in the hearing it was brought out that, because of the drilling of new wells, it was expected that the daily output would be increased far over the capacity of the pipe line to care for it, and an attempt was made by the producers to secure an order from the Corporation Commission to compel the pipe line company to provide enough additional storage tanks to take care of the anticipated surplus. The commission, however, did not act on this request.

There is no record in the transcript of Corporation Commission hearing of March 13 of any charge being made against the pipe line company of discriminating between producers in the matter of making its runs. The only reference to the subject of discrimination appears in Mr. Greer's statements already referred to, in which he stated that if the pipe line company found it necessary to prorate its runs, it would do so, under the law, without discrimination between producers. Wirt Franklin, at the Corporation Commission hearing of May 1 to 6, made the statement that the hearing of March 13 was brought about because of the charge by the producers that the pipe line company was discriminating between producers in the taking of oil.[a] This statement is not borne out by the official record of the March 13 hearing; not only was there no discussion of charges of discrimination, but Commissioner Henshaw stated at that time as follows:[b]

> This investigation was started upon my own motion, making it part of a former investigation to ascertain the relative values of oil.

According to statements made at the Corporation Commission hearing[c] on behalf of the Magnolia Pipe Line Co., the officers of the pipe line did not attempt to establish any system of prorating their runs between producers until March 23, because up to that time they had hoped to be able to take care of all of the output of the field. On March 23 the pipe line company gave oral notice through its field manager, C. R. Stewart, that it would take only 4,000 barrels per day from the field. This led to special attention being given to the subject of an equitable prorating of the runs from producers.

[a] Transcript of Corporation Commission hearing, pp. 36–37.
[b] Transcript of Corporation Commission hearing, p. 33.
[c] Transcript of Corporation Commission hearing, pp. 8 and 10.

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Under the law power does not appear to be vested in any one authority to determine definitely the time when a pipe line company must begin to prorate its purchases in a field whose output threatens to exceed the capacity of the pipe line. The law merely states that "if it shall be unable to perform the same, or shall be legally excusable" from purchasing all the petroleum produced, then it shall purchase "from each person and producer ratably, in proportion to the average daily production."

The position taken by the Magnolia Pipe Line Co. in regard to the charge of discrimination and its action in prorating is set forth in its response to the Corporation Commission, filed at the May 1 to 6 hearing in answer to the attorney general's complaint. It is as follows:

> This defendant denies that it has, at any time, discriminated between the producers. It shows that, its pipe line did not begin to operate until about March 4th, 1914, and from that time up to about March 23rd, 1914, according to its best judgment and estimate, it took oil equal to the current production from the producers in the field. At any rate, if there were any inequalities between the producers, it was unintentional, and the same were adjusted within a period of thirty days from the time this defendant began to operate. About March 23rd it became apparent that the production of said field was beyond the amount that this defendant could purchase, and therefore, it then began to prorate the oil between the producers according to their respective productions, and has, as aforesaid, since said date purchased and taken all the oil that it could take with the facilities at its command, taking into consideration the difficulties that confronted it and its financial inability to do more.

A sworn statement, obtained by the Bureau of Corporations from C. R. Stewart, field manager for the pipe line company, contained the following:[a]

> That up to about March 23, 1914, the production had been in the judgment of affiant and others in charge of said pipe line, such that the Pipe Line Company could receive and handle all of it and, therefore, the Pipe Line Company was up to that date endeavoring to take, and took as far as practical, the entire current production (not including the stock oil), deeming such course a fair and substantial compliance with the Oklahoma statutes.

The records of the Magnolia Pipe Line Co. show that on January 24 Frank Edington, a gauger of the company, made a detailed report of the condition of the field, giving the names of producers and leases, the number of wells completed, number of wells drilling, total estimated daily production from each lease, and the quantity of "stock" or storage oil held on each lease. He reported a total estimated daily production for the field of 1,555 barrels, and 23,825 barrels of "stock" oil. On March 25, in a similar detailed report, he reported the total estimated daily production of the field at 9,625 barrels, and the quantity of oil in storage at 32,915 barrels. The Bureau of Corporations has computed from the data, found in the Magnolia Pipe Line files, dealing with well-completion reports, records of pipe-line runs, statements of stock oil on leases, and of estimated daily production on the leases, the total estimated production based on the estimated daily capacity of the wells, and the total estimated production, based on the records of the pipe-line runs from each lease together with the stocks of oil stated in the gaugers' reports to have been on the leases on January 24 and March 25.

[a] See Exhibits 13, 14, and 15, pp. 112–114, for the statements of C. R. Stewart and Frank Edington.

The Bureau finds that the quantity of oil produced in the field for the period January 26 to March 22, inclusive, if computed on the basis of the reported estimated daily production of each lease, was 229,825 barrels, and, if computed on the basis of pipe-line runs, producers' records and stocks of oil on hand on the leases, was 170,220 barrels. (See note, Table 11, p. 83.) The total pipe-line runs during this period were 170,667.05. The actual pipe-line runs were about 74 per cent of the total production, computed on the basis that each well produced each day up to its full rated capacity, and were about 100.3 per cent of the total production, computed on the basis of oil actually run off the leases through the pipe line, taking into consideration estimated stocks on hand on January 26 and March 23 and certain producers' records. The Bureau considers that the latter basis is the more reliable one to follow, since there is abundant evidence that the wells, on many of the leases, were not allowed during this period to produce at their full capacity, because of the lack of storage facilities in which to keep the oil until the pipe line company ran it. As is shown elsewhere (see p. 86), this does not necessarily mean that the pipe line company took the current actual output of each producer.

There is evidence that a part of the oil taken during this period was "stock" oil accumulated before January 26. For example, according to Mr. Edington's report of February 25, the "stock" oil in storage in the field amounted to 18,975 barrels. This was a reduction from the stock oil reported for January 24 of 4,850 barrels. Between February 25 and March 25, according to the Edington reports, the amount of stock oil increased 13,940 barrels, which represents the excess of the actual output of the field over the pipe-line runs during that period.

The acts of the pipe line company, alleged by the producers to have been discriminations, all took place prior to March 23, the date on or about which, according to the statement of the pipe line company, it became apparent to them that the production of the Healdton field was beyond the quantity that they could purchase.

The attorney general, in his bill of complaint which brought about the Corporation Commission hearing of May 1 to 6, used general

terms in charging the acts of discrimination. In enumerating the "forbidden and unlawful practices in the purchasing and piping from said Healdton oil field" he specified, among other practices as follows:

> By reason of discrimination as between the producers of oil in said Healdton field, in taking the full supply produced by one individual and refusing any part of that offered by another.

Section 3. Alleged discrimination in favor of the McMan Oil Co.

At the hearing the only instance of alleged discrimination on which evidence was heard involved a charge of favoritism in behalf of the McMan Oil Co. As this instance has been given much prominence by the producers before, during and after the hearing, and it, with one other instance, which was not discussed at the hearing, appears to be, so far as the Bureau's investigation has been able to find, the principal specific instance on which the producers based their charges of discrimination, the evidence will be examined at some length.

The charge of discrimination in favor of the McMan Oil Co. was based on two grounds—first, that the company was allowed to use a field pump to force its oil from its tanks on its Woodworth lease through the Magnolia Pipe Line Co.'s gathering line into that company's storage tank, while the other companies, with one exception, were running the oil from their tanks into the company's line by gravity; and second, that the pipe line company was taking the McMan's oil as fast as it came from the wells, but did not take the storage (or stock) oil of other companies, which had previously been accumulated.

The evidence either given by witnesses at the hearings, or collected by the Bureau of Corporations, establishes the fact that the McMan Oil Co. installed a field pump to force the oil from the storage tanks which received the production of their wells on the Woodworth lease, in the southwest quarter of section 32, township 3 south, range 3 west, into the 6-inch gathering line of the Magnolia Pipe Line Co., which ran east and west between section 32, of the foregoing township, and section 5 of the next township to the south. This 6-inch gathering line also received oil from adjoining leases, operated by other companies, the oil from all such other leases being run by gravity from their storage tanks, and not by means of a pump. A letter written on March 20, by G. W. Jennings, superintendent of the Crystal Oil Co., to Wirt Franklin, president of the same company, gives a clear description of the situation at that time. (See Exhibit 16, p. 115.) The production from the wells on the leases of the Producers' Oil Co. and the 1911 Oil Co. had to pass the McMan lease on its way to the pipe-line storage tanks; that from the McMan had to pass the leases of the Ideal Oil Co. and of Wrightsman & Foster.

G. W. Jennings testified at the Corporation Commission hearing[a] of May 1 to 6 that the properties of the Ideal Oil Co. directly on the east and the 1911 Oil Co. directly on the west were on the same elevation as that of the McMan Oil Co., and that the Ideal and 1911 oil was run by gravity, while the McMan oil was being pumped into the pipe line. When questioned by counsel for the pipe line as to whether he had made a test to see if at that particular time the McMan oil would run by gravity or had to have a pump, Mr. Jennings admitted that he did not test it.

On the other hand, R. M. McFarlin, vice president of the McMan Oil Co., testified that at about March 20 his company had tried for several days to run their oil, and that the 1911 Oil Co.'s property west of them was on a ridge and a good deal higher than the McMan property and had 1,600-barrel tanks; that, when the 1911 Oil Co. turned on their oil, the McMan oil would not come out at all, because its tanks (of 250 barrels capacity) were smaller and lower; that thereupon the pipe line tried to run the McMan oil east, the line coming over the Ideal Oil Co.'s lease, but that the oil would not gravitate over the ridge, and that therefore the pipe line company furnished the McMan company a pump and that they pumped over into that line at such times as the Ideal Oil Co. was not running its oil. He claimed a daily production from the wells on the lease which were not shut in at that time of from 2,500 to 2,600 barrels.[b]

According to the G. W. Jennings letter of March 20 (see Exhibit 16, p. 115), the McMan Oil Co. at the time of his investigation was using a field pump to empty two of their tanks. Also, oil was being run into the pipe line from one of the Ideal Oil Co.'s 1,600-barrel tanks and from one of the Producers' Oil Co.'s 1,600-barrel tanks. The statement in regard to the Ideal Oil Co. is at variance with R. M. McFarlin's testimony at the Corporation Commission's hearing, to the effect that the McMan Oil Co. pumped over into the Ideal Oil Co.'s line at such times as that company was not running its oil.[c]

No complaint on the part of the Ideal Oil Co. in regard to the pipe line company's conduct in running oil from their lease has been brought to the notice of the Bureau of Corporations. C. J. Wrightsman stated to an agent of the Bureau that from the very beginning the pipe line discriminated in favor of the McMan Oil Co. and the Corsicana Petroleum Co. in running the oil. On the other hand, John F. Black, the manager of the Producers' Oil Co., stated to the same agent that, while it was easily possible for the pipe line com-

[a] Transcript of Corporation Commission hearing, pp. 126–129.
[b] Transcript of Corporation Commission hearing, pp. 150–170.
[c] Transcript of Corporation Commission hearing, p. 152.

pany to make a mistake in their efforts to serve all producers alike, according to their output, the best information he could get from the Producers' field manager disclosed nothing that would justify any claim of discrimination.

E. A. Latimer, general manager of the Magnolia Pipe Line Co., informed the Bureau that the pump was installed on March 8, and its use discontinued on March 23, because the 6-inch gravity line was extended so that the pipe line company was able to handle the prorated quantity by gravity. The extension was completed on March 21. No difficulty was found in running oil by gravity without the pump after the extension of the 6-inch gravity line.

Mr. McFarlin, in his testimony at the hearing, in answer to a question concerning the necessity of using a pump to get his oil into the pipe line company's gathering line, stated: [a]

> Ours wouldn't gravitate out that way when the 1911 people were on with 1,600-barrel tanks, and, another thing, the Magnolia had been furnishing 1,600-barrel tanks to the other people. They never did furnish my people that. I couldn't buy one at this time.

The following statement, based on the G. W. Jennings letter of March 20 (see Exhibit 16, p. 115), shows the relative storage capacity of the different producing properties near the McMan Oil Co.'s lease:

Name.	Tanks.	Capacity of each.	Total capacity.
		Barrels.	*Barrels.*
1911 Oil Co.	5	1,600	9,000
	4	250	
Ideal Oil Co.	2	1,600	3,200
Producers' Oil Co.	2	1,600	3,200
Wrightsman & Foster	3	1,600	4,800
McMan Oil Co.	5	250	1,250

It is obvious that with a total storage capacity of only 1,250 barrels and an estimated production of from 2,500 to 2,600 barrels per day, that it would be necessary to draw oil from the McMan tanks more or less continuously in order to keep them from overflowing. And, if it is a fact, as was claimed by Mr. McFarlin, and no evidence to prove the contrary was introduced at the Corporation Commission hearing, that the oil would not flow by gravity from the storage tanks of this lease into the pipe line, under the conditions which existed on or about March 20, then it is evident that no discrimination against other producers was involved in the use of a pump by the McMan company so long as the quantity of oil taken from

[a] Transcript of Corporation Commission hearing, p. 152.

them through that means did not exceed the proportion of their daily production which they were entitled to have run. In other words, the fact that the McMan Oil Co. was allowed to use a pump does not of itself show discrimination in their favor on the part of the Magnolia Pipe Line Co.

The estimated production for this lease, as computed from the records of the Magnolia Pipe Line Co. by the Bureau of Corporations for the period February 1 to March 22, inclusive, was 24,292.72 barrels and the actual pipe-line runs during that period 23,042.34 barrels, or 94.9 per cent of the oil produced. The pipe line company during this period, January 26 to March 22, inclusive, took a quantity of oil equal to 100.3 per cent of the current production of the field. It, therefore, did not take from the McMan Oil Co., by 5.4 per cent, the quantity of oil which that company was entitled to have run during that period.

During the period from March 23 to May 11, inclusive, when the prorating system established by the pipe line company was in effect, the quantity of oil bought by that company from the McMan Oil Co. was 1,682.28 barrels or 11.9 per cent more than it was entitled to have taken under the pro rata proportion.

Section 4. Alleged discrimination in favor of the Corsicana Petroleum Co.

The Corsicana Petroleum Co., as has been already stated, is the producing branch of the Magnolia interests, and is connected with the Magnolia Petroleum Co. and the Magnolia Pipe Line Co. through having a number of prominent stockholders in common. The Corsicana Petroleum Co. owns several leases in the Healdton field which are held or operated under its own name. The first well to be completed on such leases was well No. 1 on the Roy Chilton lease, completed March 31. There was no production run from any of these leases prior to March 31, 1914, and no field pumps were used to force the oil into the pipe lines. The Corsicana Petroleum Co. also has part interest in six leases in which the McMan Oil Co. is also interested. The first wells to be completed on such leases were well No. 2, on March 23, and well No. 1, on March 24, both on the E. T. Richards lease. The charge that the pipe line company has discriminated in favor of the Corsicana Petroleum Co. apparently arose from the belief on the part of various producers that the Corsicana Petroleum Co. had benefited in some way through the alleged favoritism shown the McMan Oil Co. in allowing that company to use a pump on one of its leases. As will be seen from Table 1, on page 14, in which all of the holdings of the Corsicana Petroleum Co. are listed, it had no interest in the Woodworth lease in the southwest quarter of section 32, township 3 south, range 3 west, which is the

lease referred to in the charge that the pipe line discriminated in favor of the McMan Oil Co. (See p. 68.)

Section 5. Alleged discrimination in favor of the Dundee Petroleum Co.

The Red River Oil Co. was organized for the purpose of drilling oil and gas wells in the southwestern part of Oklahoma. The Dundee Petroleum Co. was later organized to take over the property and business of the Red River Oil Co. and of another company, the Ralston Oil Co., which does not operate in the Healdton field. It should be observed that when informants were discussing the alleged discrimination that some called the company the Dundee, and some the Red River, but that they all referred to the use of a pump, by the company in question, in running oil, at or about March 20 from the Carrie L. McClure lease, in the southwest quarter of section 5, township 3 west, range 4 south.

The G. W. Jennings letter of March 20 (see Exhibit 16, p. 115) called the attention of Wirt Franklin, president of the Crystal Oil Co., to the length of time it took to run by gravity a 1,600-barrel tank of oil into the pipe line, pointed out that the Red River Oil Co. with similar connections to the pipe line were using a pump, and requested Mr. Franklin to see if he could not get the Crystal Oil Co. a pump.

Wirt Franklin, on April 27, stated to an agent of the Bureau that the Dundee Petroleum Co. is composed of old producers who have had dealings with the Standard Oil Co. in other fields, and they had always received much better treatment from the pipe line company than had the rest of the producers. He claimed that the fact that the McMan and the Dundee companies were permitted to use pumps when the other producers had to be content with running the oil by gravity was pretty strong evidence of discrimination, for when the pumps were working it was impossible for the oil running through gravity lines to enter the gathering line, as the pressure from the pumps not only held the gravity oil back, but in numerous instances the gravity oil was forced back into the tanks from which it should have been flowing freely. B. A. Simpson and L. H. Love, officials of the Ardhoma Oil Co., stated, on April 29, to an agent of the Bureau that up to the last week in March the McMan Oil Co. and the Red River Oil Co. were favored and permitted to use pumps to force their oil into the gathering lines, while all other producers had to rely upon the gravity system; that every time the Red River company started its pump it would force the oil back into the tanks of the Ardhoma company and it was impossible to run any oil until the Red River pump was stopped, and that about March 23 the pipe line company made the Red River company quit using its pump to force its oil into the gathering line. The name of the Dundee Petroleum Co. first appears in the transcript of the Corporation Commission hearing of May 1 to 6, on page 126, when, during the testimony of Mr. Jennings, Attorney General West asked, "Was there any other company being treated like the Dundee and the McMan?" and received the following answer: "Not exactly. The Dundee had a small pump." No further mention of any alleged favoritism shown the Dundee Petroleum Co. occurred at the hearing.

On April 28 W. S. Critchlow, secretary and general manager of the Red River Oil Co. and the Dundee Petroleum Co., stated to an agent of the Bureau that he had heard the other producers had made complaint because his company was using a pump to force its oil into the gathering line, but this was a right that every producer had in all other fields and his company simply followed custom until the pipe line company requested that the pump be stopped. Later, in a sworn statement made to the Bureau of Corporations, J. M. Critchlow, president of the Dundee Petroleum Co., not only emphatically denied that any favoritism had been shown to his company by the pipe line company but he also asserted that his company had had less than its proper proportion of oil run and to that extent had been discriminated against. He stated, however, that he was convinced that the reason for this apparent discrimination lay in the newness and the unexpected situations arising in the field, and that he was not disposed to blame the pipe line company. E. A. Latimer, general manager of the Magnolia Pipe Line Co., informed the Bureau that the pump was installed about March 1 and its use discontinued on March 23 on account of the reduction in pipe-line runs, which made it possible to handle the output by gravity. Before that there was difficulty in handling the oil by gravity.

The estimated production for the Dundee Petroleum Co. leases, as computed by the Bureau for the period January 26 to March 22, inclusive, was 15,372.52 barrels and the actual pipe-line runs during that period 23,642.44 barrels, or 153.8 per cent of the oil produced. The pipe line company during this period took a quantity of oil equal to 100.3 per cent of the estimated current production of the field. It, therefore, took from the Dundee Petroleum Co. 53.5 per cent more than the quantity of oil which that company was entitled to have run during that period, in view of the fact that the current production of all the other producers was not also taken. This extra oil was storage oil, accumulated before the pipe line company began on January 26 to purchase oil in the Healdton field. According to the January 24 report of Frank Edington, the pipe line company gauger, the Dundee Petroleum Co. had 13,875 barrels of storage oil accu-

mulated on its leases. According to his report of February 25, the quantity of storage oil was then 8,050 barrels, and on March 25 it was 8,840 barrels.

The Bureau's estimate of the Dundee Petroleum Co.'s storage oil as of date of January 26 is 14,875 barrels, and as of date of March 23, is 6,605.08 barrels. This is arrived at by using the estimated daily production reported by Mr. Edington and deducting the actual pipe-line runs. It will be noted that, according to these computations, based on the Magnolia Pipe Line Co.'s records, not only was the entire current production of the Dundee Petroleum Co. run at this period, but also about 8,270 barrels of storage oil.

The Bureau was not able to secure from the Dundee Petroleum Co.'s records a statement showing its actual daily production during this period, as the records were not kept in such a form that the information requested could be derived from them. It did secure a statement from the company showing the estimated daily capacity of the leases, by months.

During the period from March 23 to May 11, inclusive, when the prorating system established by the pipe line company was in operation, the quantity of oil purchased by it from the Dundee Petroleum Co. was 93.5 per cent of the quantity that company was entitled to have taken, being 2,226.17 barrels short. (See Table 12, p. 84.)

Section 6. Alleged discrimination in favor of the Paraffine Oil Co.

When an agent of the Bureau interviewed, on April 29, F. J. Alderson, manager of the Paraffine Oil Co., and discussed the subject of discrimination with him, Mr. Alderson stated that if they got any preference at all from the pipe line company it must have been because the lease and tanks were kept in good condition, and made readily accessible to the tank gaugers, so that they would not have to climb over sloppy leases or dirty field tanks.

In a sworn statement J. M. Critchlow, president of the Dundee Petroleum Co., declared that the pipe line company had taken from the 40-acre Cruce lease adjoining the 110-acre Carrie L. McClure lease of the Dundee Petroleum Co. almost as much oil as it had from the Dundee Petroleum Co.'s lease, including the latter's stock oil, although the Dundee company was an actual producer in the field before the Paraffine Oil Co. Mr. Critchlow, however, stated that he did not make this statement as a complaint against the pipe line company for favoring the Paraffine company as compared with the Dundee Petroleum Co. He considered the incident as one of the things that, owing to the newness and unorganized condition of the field, was unavoidable.

The estimated production for the lease of the Paraffine Oil Co., as computed by the Bureau of Corporations for the period January 26 to March 22, inclusive, was 10,236.54 barrels, and the actual pipe-line runs during that period were 9,523.69 barrels, or 93 per cent of the estimated production. The pipe line company during this period took a quantity of oil equal to 100.3 per cent of the current production of the field. It, therefore, did not take from the Paraffine Oil Co., by 7.3 per cent, the quantity of oil which that company was entitled to have run during that period.

Under the prorating plan of the pipe line company, the quantity of oil taken from the Paraffine Oil Co. from March 23 to May 11, inclusive, was 842.76 barrels, or 18.4 per cent greater than it was entitled to have run. (See Table 12, p. 84.)

Section 7. The production from Indian allotment lands.

The Senate resolution ordering the investigation of the Healdton situation calls for specific information concerning discrimination against oil produced on Indian allotment land. No specific charge of such discrimination has come to the attention of the Bureau of Corporations. When evidence on this particular subject was sought by an agent of the Bureau no person could be found among the Healdton producers who could furnish the slightest information in regard to any such discrimination. When the matter was called to the attention of an official of one of the principal producing concerns in the field, that was operating exclusively on allotment land, he stated that up to the date of the interview (April 30) the holders of allotment leases fared equally well with the other producers in the matter of pipe-line runs. This statement was corroborated by the stockholder of another company, which also was operating on allotment land.

At the time the Senate resolution was passed, March 28, there were but three allotment leases on which oil was being produced, namely, the Cammack Broke Shoulder and W. Tillis leases, operated by John Carlock, and Allie Daney lease, operated by Dunn & Gillam. Since that date and prior to May 12, when the inspector appointed by the Corporation Commission took charge of the prorating in the Healdton field, oil has also been produced on the Silsaney Going (née Jones) lease, operated by the Coline Oil Co., and the Walton Davis lease, operated by the Dundee Petroleum Co.

During the period from January 26, 1914, when the pipe line company began to purchase oil, to March 23, when the company gave notice that it would be unable to take the entire daily output of the field, the estimated production and the actual runs from the Indian leases then producing oil were as follows: Cammack Broke Shoulder lease, operated by John Carlock, estimated production 7,400 barrels, actual pipe line runs from the lease 2,966.70 barrels; Allie

Daney lease, operated by Dunn & Gillam, estimated production 4,000 barrels, no pipe line runs.

The above estimated production for the Broke Shoulder lease is based on the capacity of the wells, as reported by Frank Edington the pipe line company's gauger.

On March 15, he reported the completion of well No. 1 on this lease, with 500 barrels production. As the first pipe-line run from this lease took place on March 12, of 189.92 barrels, the Bureau of Corporations has, in the absence of more definite information, considered that the lease began to produce oil on March 11, and has assigned to that date a production of 500 barrels. On March 14 Mr. Edington reported a daily production of 700 barrels, on March 21 of 500 barrels, and on March 25 of 400 barrels. On March 25 he reported that there were 900 barrels of oil in storage on this lease. The amount of oil run from the lease March 23 and 24 was 383.54 barrels, or about 616.46 barrels less than the estimated production for those two days (1,000 barrels). This would leave 283.54 barrels of the storage oil assignable to the period January 26 to March 22, inclusive, and would make the quantity actually produced on the lease up to March 23, 3,250.24 barrels, instead of the estimated production of 7,400 barrels, on the basis of the potential capacity of the lease. Evidently the well on this lease was not allowed to produce at its full capacity.

The figures used in the above computations were taken from the records of the Magnolia Pipe Line Co. The Bureau of Corporations tried to secure from Mr. Carlock the actual daily production from this lease, for this period, as shown by his records, but he stated his books did not contain the desired information.

In the case of the Allie Daney lease, operated by Dunn & Gillam, on March 15, Mr. Edington reported the completion of well No. 1, with 350 barrels, and on March 20, of well No. 2, with 400 barrels. On March 25 he reported a daily production of this lease of 250 barrels. On the basis of these figures the estimated production up to March 23 would be 4,000 barrels, and up to March 25, 5,500 barrels. As there were no pipe-line runs from this lease the quantity in storage on March 25 should represent the total production up to that time. Mr. Edington reported on March 25 that there were 400 barrels in storage on this lease. Evidently the wells on this lease were not allowed to produce at their full capacity.

The figures used in the above computations were taken from the records of the Magnolia Pipe Line Co. The Bureau of Corporations tried to secure from Dunn & Gillam the actual daily production from this lease for this period, as shown by their records, but was not able to obtain it.

On April 7, 1914, D. H. Kelsey, superintendent of the Indian agency at Muskogee, telegraphed the Magnolia Pipe Line Co. as follows:

> Our field inspector reports likelihood of serious oil waste from Silsaney Jones, Allie Daney and Broke Shoulder Allotments in Section four, Healdton. Have requested lessees to restrict new development and urge you to run present production to highest percentage possible without discriminating against other lessees. Please advise what proportion you are taking from these restricted Indian leases.

The correspondence in the Magnolia Pipe Line Co. files shows that an investigation was at once made by the company officials. As a result of it, on April 8, George C. Greer, general attorney for the pipe line company, sent the following telegram to Mr. Kelsey:

> Our field men advise have been taking thirty per cent of total production of Healdton field, including Silsaney Jones, Allie Daney and Cammack Broke Shoulder Allotments, and will do everything possible without discriminating to relieve the situation.

The following table, compiled from information found in the records of the Magnolia Pipe Line Co., shows the status of the estimated production, the pro rata apportionments and pipe-line runs on the Indian leases at this time:

TABLE 10.—ESTIMATED PRODUCTION, PRO RATA PROPORTION, AND PIPE-LINE RUNS ON THE INDIAN LEASES IN THE HEALDTON FIELD, APR. 1-15.

John Carlock (Cammack Broke Shoulder lease).

Date.	Pro rata established for field.	Estimated production.	Production entitled to have run under pro rata.	Pipe-line runs.	Pipe-line runs compared with pro rata.	
					Over.	Short.
	Per cent.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
March 23-31, inclusive	.....	3,800	1,457	1,504.77	47.77	.....
April 1	32.6	350	114	.....	.....	66.23
April 2	33.9	350	118	291.96	107.73	.....
April 3	32.9	350	115	.....	.....	7.27
April 4	33.5	350	117	.....	.....	124.27
April 5	30.6	350	107	.....	.....	231.27
April 6	30.4	350	107	295.76	.....	42.51
April 7	30.4	350	106	.....	.....	148.51
April 8	27.4	350	96	.....	.....	244.51
April 9	27.3	350	96	401.94	61.43	.....
April 10	25.5	350	89	.....	.....	27.57
April 11	22.9	350	80	.....	.....	107.57
April 12	22.3	350	78	.....	.....	185.57
April 13	21.8	350	76	385.36	123.79	.....
April 14	20.8	350	73	.....	50.79	.....
April 15	18.1	350	64	.....	.....	13.21

TABLE 10.—ESTIMATED PRODUCTION PRO RATA PROPORTION, AND PIPE-LINE RUNS ON THE INDIAN LEASES IN THE HEALDTON FIELD, APR. 1-15—Continued.

Coline Oil Co. (Silsaney Jones lease).

Date.	Pro rata established for field.	Estimated production.	Production entitled to have run under pro rata.	Pipe-line runs.	Pipe-line runs compared with pro rata.	
					Over.	Short.
	Per cent.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
March 23-31, inclusive[a]	.....	.....	.....	.....	.....	.....
April 1	32.6	350	114	198.52	84.52	.....
April 2	33.9	350	118	.....	.....	33.48
April 3	32.9	350	115	208.37	59.89	.....
April 4	33.5	350	117	209.93	152.82	.....
April 5	30.6	450	138	.....	14.82	.....
April 6	30.4	450	137	.....	.....	122.18
April 7	30.4	450	137	205.38	.....	53.80
April 8	27.4	450	123	207.09	30.29	.....
April 9	27.3	450	123	.....	.....	92.71
April 10	25.5	450	115	209.93	2.22	.....
April 11	22.9	450	103	211.64	110.86	.....
April 12	22.3	450	100	.....	10.86	.....
April 13	21.8	450	98	.....	.....	87.14
April 14	20.8	450	94	211.88	30.74	.....
April 15	18.1	450	82	.....	.....	51.26

Dunn & Gillam (Allie Daney lease).

March 23-31, inclusive	.....	3,250	1,251	757.48	.....	493.52
April 1	32.6	350	114	196.66	.....	410.86
April 2	33.9	350	118	196.28	.....	332.58
April 3	32.9	350	115	199.28	.....	248.30
April 4	33.5	350	117	199.64	.....	165.66
April 5	30.6	350	107	.....	.....	272.66
April 6	30.4	350	106	.....	.....	378.66
April 7	30.4	350	106	176.72	.....	307.94
April 8	27.4	350	96	.....	.....	403.94
April 9	27.3	350	96	.....	.....	499.94
April 10	25.5	350	89	184.54	.....	404.40
April 11	22.9	500	114	.....	.....	518.40
April 12	22.3	500	112	.....	.....	630.40
April 13	21.8	700	152	192.96	.....	589.44
April 14	20.8	700	146	197.64	.....	537.80
April 15	18.1	700	127	.....	.....	664.80

In the foregoing table the pro rata percentages were computed by obtaining the proportion which 4,000 barrels, the daily amount to be taken from the field by the pipe line company, bore to the total estimated[b] production for each day. The daily figures of estimated production were taken from the Magnolia Pipe Line Co.'s records, as were also the figures of pipe-line runs. The daily pro rata proportion of the production of each lease was computed by the Bureau by applying the pro rata percentage to the estimated daily production. The over and short columns represent subtractions between the pro rata production figures and the pipe-line runs for each day.

[a] No production reported before April 1 for this lease.

[b] For the three producers who had authoritative records, the actual production was used.

In the case of the Cammack Broke Shoulder and the Silsaney Jones leases it is evident from an inspection of the over and short columns that the oil to which they were entitled under the pro rata system was being taken and adjustments made at frequent intervals, since an excess would be changed to a deficit, or vice versa, every few days. In the case of the Allie Daney lease, while apparently the oil produced from April 1 to April 14 was being taken approximately according to the pro rata existing at that time, all of the quantity called for according to the pro rata had not been taken between March 23 and April 1.

The Magnolia Pipe Line Co., in determining the quantity to be taken from this lease at the earlier period, did not figure any pro rata on the production on this lease prior to March 28. On that date it estimated the production to be 250 barrels and the proportion to be taken as 104 barrels, making 416 barrels for the four remaining days in March. But, according to the monthly report, dated March 25, of Frank Edington, the pipe line company's gauger, this lease was reported to have a production of 250 barrels a day and 400 barrels in storage. Mr. Edington had previously reported the production of the two wells on this lease—one in his well-completion report of March 15, with 350 barrels initial production, and one in his well-completion report of March 20, with 400 barrels initial production.

On the basis of the above information the Bureau has considered that this lease had an estimated production of 750 barrels daily for March 23 and 24, and for the period from March 25 to March 31, inclusive, an estimated production of 250 barrels per day. The quantity entitled to be run under the pro rata, computed on this basis, is 1,251 barrels, instead of 416. The actual runs from this lease during the period from March 23 to 31, inclusive, were 757.48 barrels, or 493.52 less than the quantity it was entitled to have run.

By May 12, on which date the inspector appointed by the Corporation Commission took charge of the prorating, the excess of total quantity the lease was entitled to under the pro rata over the total of pipe-line runs was 62.78 barrels. (See Table 12, p. 84.) The inequality had already been equalized on May 4, on which date the total pipe-line runs were in excess of the total quantity the lease was entitled to under the pro rata. In the light of the Oklahoma statute, which says that inequalities must be equalized within a period of 30 days (see p. 61), according to the Magnolia Pipe Line Co.'s computations, there was apparently a discrimination in favor of this lease, in that more than the proportion of oil it was entitled to under

the pro rata was run during a continuous period of 50 days (March 23 to May 11, inclusive), while, according to the Bureau's computations, there was apparently a discrimination against this lease, in that less than the proportion of oil it was entitled to under the pro rata was run during a continuous period of 42 days (March 23 to May 3, inclusive). It should be pointed out, however, that not only is there a discrepancy between the different pipe-line records in regard to the daily production capacity of this lease prior to March 28, but no definite information on this point could be obtained from the Dunn & Gillam records. Nothing was found in the pipe line company records that would indicate an intent to discriminate either in favor of or against this lease, and any intent to discriminate in favor of any lease is denied in the affidavits of C. R. Stewart and Frank Edington. (See Exhibits 13 and 14, pp. 112–114.)

The following statement gives a summary of the total quantity assigned to each Indian lease under the pro rata system in force by the Magnolia Pipe Line Co. from March 23 to May 11, inclusive, the total pipe-line runs during that period from each lease, and the extent to which the pipe-line runs exceeded or fell short of the quantity which each lease was entitled to have run:

Producer and lease.	Amount entitled to be run under the pro rata.	Pipe-line runs.	Comparison between pro rata and pipe-line runs.	
			Over.	Short.
John Carlock:	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels*
C. Broke Shoulder	3,698.00	3,560.63	.....	137.37
Wm. Tillis	3,367.00	3,482.79	115.79	.....
Coline Oil Co.: Silsaney Jones	3,799.00	4,173.31	374.31	.....
Dundee Petroleum Co.: Walton Davis	199.00	.....	.....	199.00
Dunn & Gillam: Allie Daney	6,583.00	6,520.22	.....	62.78
Total on Indian leases	17,646.00	17,736.95	90.95	.....

For the computation of the quantity of oil each lease was entitled to have run under the pro rata system established by the Magnolia Pipe Line Co., the Bureau has used the estimated daily capacity of the wells on each lease in the above table, as shown by the records of the Magnolia Pipe Line Co. How far such estimates are in accordance with the actual potential output of each lease, were wells allowed to run to capacity, the Bureau is not in a position to state, since it was not able to obtain from the records of the producers operating these leases definite information on this subject.

In view of the lack of definite and trustworthy records concerning the actual and the potential production of the various oil properties in the Healdton field prior to May 12, when the inspector of the

Oklahoma Corporation Commission took charge of the prorating of the oil to be run from each producer, the Bureau does not consider it possible to determine whether there was even a technical discrimination against the Allie Daney lease. According to the Bureau's computations, based on statements found in the Magnolia Pipe Line Co.'s records, there were during the period March 23 to May 11, inclusive, 42 days when less oil was taken from the lease than it was entitled to under the pro rata. If these computations represent the actual conditions, there was a discrimination against this lease during a period of 12 days beyond the 30 days allowed by Oklahoma law for correcting inequalities. But the number of obvious errors encountered by the Bureau in its examination of the Magnolia Pipe Line Co.'s records of estimates of production, and also of stocks on hand raises a reasonable doubt as to the accuracy of all such statistics. As is pointed out later (see below), the Bureau believes that the statistics of pipe-line runs obtained from the Magnolia Pipe Line Co.'s records are to be relied upon, and it accepts as trustworthy also the production records of three producers, as determined by their daily gauges of the oil produced on their leases. But the Bureau considers that the Magnolia Pipe Line Co.'s estimates of daily production on the leases and of stocks on hand on them, while the best information of the kind in existence, is not sufficient to determine the question of discrimination, even were there no doubts concerning the construction of certain features in the application of the law.

Section 8. Statistics of production and pipe-line runs collected by the Bureau.

For the examination of the question of discrimination between producers it was of great importance to secure reliable records of the quantity of oil produced daily by each producer, as well as of the quantity taken from his property by the pipe line company. The Bureau was successful in obtaining information which it considers trustworthy, covering the quantity taken by the pipe line from each producer and covering the quantity produced daily by three producers, for portions of the period between January 26 and May 11, inclusive. The information relating to the pipe-line runs was obtained from the records of the Magnolia Pipe Line Co. The information relating to the daily production of the three producers was obtained from the records of the Crystal Oil Co., the Producers' Oil Co., and the W. & F. Oil Co. In each case the records showed the results of gauges actually made of oil contained in tanks. They do not show estimates.

The Bureau was not successful in obtaining information which it considers trustworthy covering the daily quantity produced by

others than the above-mentioned three producers. It diligently endeavored to secure this information, but was met by the statement of most of the producers that they had no records from which it could be obtained. The information concerning the daily production of producers other than the three who had trustworthy records was obtained from the records of the Magnolia Pipe Line Co. That company's field men reported, from time to time, estimates of the initial production of various wells completed in the field, estimates of the daily quantity being produced on certain dates by the different producers, and estimates of the amount of storage or "stock" oil held by them, on their leases, pending its purchase by the pipe line company. While such information is of value, in that in a rough way it gives sufficiently accurate details for some of the purposes for which it was used, yet the Bureau does not consider it sufficiently accurate to determine whether discrimination actually took place within the meaning of the statute. The Bureau has abundant evidence showing that certain of the estimates of daily production and of stocks on hand are incorrect. It has no means of judging whether the others are correct or not.

The statistics in the following tables must be considered in the light of the foregoing remarks, and in any use made of them the different degrees of accuracy of the different kinds of information presented must be taken into account.

The following table gives a statement of production and pipe-line runs for the period from January 26, when the pipe line company began to purchase and run oil from the producers, to March 22, inclusive, when it established a prorating system. All of the figures shown were derived from records of the Magnolia Pipe Line Co., with the exception of those from the three producers, above mentioned, who had trustworthy information concerning their daily production.

TABLE 11.—PRODUCTION AND PIPE-LINE RUNS, JAN. 26 TO MAR. 22, 1914.

Producer.	Production.			Pipe-line runs.
	Computed on basis of estimated daily capacity.	Computed on basis of pipe-line runs and stocks on hand.	Taken from producers' records of actual gauges.	
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*
Alma Oil Co.	15,350	9,461.27		8,779.94
Ardhoma Oil Co.	10,925	11,922.66		9,602.32
Carlock, John	7,400	3,250.24		2,966.70
Crystal Oil Co.	12,490	7,931.76	9,096.38	5,692.45
Dundee Petroleum Co.	39,370	15,372.52		23,642.44
Dunn & Gilliam	4,000			
Gunsburg & Forman	14,525	13,875.95		13,063.72
Humble Oil Co.	16,520	11,491.94		14,418.12

TABLE 11.—PRODUCTION AND PIPE-LINE RUNS, JAN. 26 TO MAR. 22, 1914—Continued.

Producer.	Production.			Pipe-line runs.
	Computed on basis of estimated daily capacity.	Computed on basis of pipe-line runs and stocks on hand.	Taken from producers' records of actual gauges.	
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*
Ideal Oil & Gas Co.	20,250	16,048.99		16,048.99
Maloney Oil & Gas Co.	1,800	1,805.67		1,246.77
McMan Oil Co.	29,240	24,292.72		23,042.34
Merrick, F. W.	800	200.22		200.22
1911 Oil & Gas Co.	22,100	20,818.28		21,633.11
Paraffine Oil Co.	8,485	10,236.54		9,523.69
Producers' Oil Co.	8,750	8,570.91	9,617.52	7,568.95
Rex Oil & Ref'y Co.	3,040	2,038.31		2,438.31
Schermerhorn, J. B.	1,600	1,470.41		848.80
Twin State Oil Co.	6,230	372.50		1,267.50
Westheimer & Nichols	6,200	8,515.26		8,291.70
W. & F. Oil Co.	750	390.98	[a] 332.62	[a] 390.98
Total	229,825	168 067.13		170,667.05

[a] The discrepancy between the gauge of production and the gauge of the oil run may be due to a mistake on the part of one of the gaugers, or to a difference in the time the gauges were taken.

NOTE.—The Bureau considers that the total of 170,220, obtained by using the quantities taken from the producers' records of actual gauges in place of their estimated production, based on pipe-line runs and stocks on hand, represents more nearly the actual conditions.

From the foregoing table it will be noted that the production for the period shown, if computed on the basis of estimated daily capacity, was 229,825 barrels, and if computed on the basis of pipe-line runs and stocks on hand, was 168,067.13. If the production shown by the records of actual gauges be used instead of that based on pipe-line runs and stocks on hand for the three producers from which it was obtainable, the total production was 170,220 barrels.

Probably 170,220 barrels is the figure which most nearly represents the actual production. It is derived from two sources of trustworthy information, the actual tank gauges of pipe-line runs and of producers, and one source, stocks on hand, where the information consisted of estimates, the accuracy of some of which is open to question. The total production computed on the basis of estimated daily production is untrustworthy not only because of errors in the estimates of the capacity of the wells but also because the flow of many of the wells was restricted from time to time by the producers, and there is no information obtainable as to the periods of diminished production.

Most of the producers in their statements to the Bureau claimed a producing capacity for their wells in excess of that estimated by the pipe line company's gauger. Few producers, however, have any records that would substantiate their claims in even this respect, while records showing their actual daily production were almost wholly lacking.

The following table presents a statement for the period from March 23, when the pipe line company established a system of prorating its purchases from the different producers, to May 11, inclusive, when the inspector appointed by the Corporation Commission took charge of the prorating of production and pipe-line runs in the Healdton field.

TABLE 12.—STATEMENT OF PRO RATA OF PRODUCTION, PIPE-LINE RUNS, AND COMPARISON OF PIPE-LINE RUNS WITH PRO RATA PRODUCTION, MAR. 23 TO MAY 11, 1914.

Producer.	Pro rata of production.	Pipe-line runs.	Comparison of pipe-line runs with pro rata production.	
			Over.	Short.
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*
Adkins, Conrad & Nichols	1,801	1,663.34	.....	137.66
Alma Oil Co	10,848	9,488.37	.....	1,359.63
Ardhoma Oil Co	7,859	8,913.21	1,054.21	.....
Carlock, John	7,065	7,043.42	.....	21.58
Coline Oil Co	3,799	4,173.31	374.31	.....
Corsicana Petroleum Co	3,289	3,495.16	206.16	.....
Crosbie & Beatty	2,927	2,966.50	39.50	.....
Crystal Oil Co	3,690	3,821.31	131.31	.....
Dundee Petroleum Co	34,002	31,775.83	.....	2,226.17
Dunn & Gillam	6,583	6,520.22	.....	62.78
Geneva Pearl Oil Co	750	683.07	.....	66.93
Gunsburg & Forman	5,310	6,644.77	1,334.77	.....
Healdton Oil & Gas Co	35	.....	.....	35.00
Hernstadt, S. J	6,444	6,907.06	463.06	.....
Humble Oil Co	7,955	9,599.76	1,644.76	.....
Ideal Oil & Gas Co	3,758	4,351.13	593.13	.....
Maloney Oil & Gas Co	3,133	3,334.34	201.34	.....
McMan Oil Co	14,148	15,830.28	1,682.28	.....
Merrick, F. W	5,866	5,495.48	.....	370.52
Mutual Benefit Oil Co	14,992	13,082.38	.....	1,909.62
1911 Oil & Gas Co	10,052	11,811.05	1,759.05	.....
P. & H. Oil Co	65	417.11	352.11	.....
Paraffine Oil Co	3,743	4,585.76	842.76	.....
Producers' Oil Co	3,778	4,920.49	1,142.49	.....
Rex Oil & Ref'y Co. No. 1	5,318	6,112.20	794.20	.....
Rex Oil & Ref'y Co. No. 2	3,501	3,658.41	157.41	.....
Schermerhorn, J. B	6,529	7,550.87	1,021.87	.....
Twin State Oil Co	7,368	5,353.15	.....	2,014.85
W. & F. Oil Co	10,145	6,840.49	.....	3,304.51
Westheimer & Daube	1,377	1,755.88	378.88	.....
Westheimer & Nichols	3,870	4,927.12	1,057.12	.....
Total	200,000	203,721.47	15,230.72	11,509.25

The total production during the period shown in the above table was 1,067,902 barrels, using the estimates by the pipe line company of daily production and the actual production for those producers who had records of actual gauges. If the estimates made by the pipe line be used for all producers, then the total production would be 1,056,516 barrels. The largest proportion of the current production run on any one day was on March 27, when about 40 per cent of the estimated production was run. The lowest proportion was on May 11, when about 11 per cent was run.

In its computation of the quantity which each producer was entitled to have run under the pro rata established, the Bureau used the production as shown by the actual gauges for the quantity produced by the three producers from whose records it could be obtained, and for the other producers it used the estimated daily production of each lease as shown in the records of the Magnolia Pipe Line Co. It should be pointed out, in connection with this table, that most of the producers claimed a producing capacity of their wells considerably in excess of that estimated by the pipe line company's officials.

The Bureau has evidence that in the cases of some producers the producing capacity of their wells was considerably underestimated, but it has clear proof of this in only one instance. In that case the actual production, as measured by the tank gauges, exceeded the daily production estimated for the producer by the pipe-line gauger, and consequently the daily pro rata computed by the company, on the basis of the gauger's report, was less than it should have been. In the other cases where the actual production, as measured by the tank gauges, was obtained, the daily production as shown by the measurements was less than the daily production estimated for these producers by the pipe-line gauger.

Since the producers claimed to have been compelled to restrict the production of their wells during this period because of the inability of the pipe line company to take care of the current daily production of the field, their actual production would not necessarily be a measure of the potential capacity of their wells. In the opinion of the Bureau they were entitled to have the quantity of oil which was taken under the prorating system computed on the basis of their potential capacity, not their actual production. They had no records, however, which would show conclusively the potential daily capacity of their properties. If the pipe line company's estimates of daily production were used in place of the records of actual gauges, the total production for March 23 to May 11 for these three producers would appear as 86,515 barrels, instead of 97,900.52 barrels, the basis used by the Bureau in the foregoing table.

The figures of estimated daily production and actual production shown by tank gauges and pipe-line runs were tabulated by the Bureau to show for each producer and lease each day's production for the period from January 26 to March 22, inclusive, the quantity

entitled each day under the pro rata for the period from March 23 to May 11, inclusive, and the pipe-line runs on each day.

According to these detailed tabulations, which are not published in this report but which form the basis of Tables 10, 11, and 12, there were, in the period from January 26 to March 22, inclusive, several producers for whom the inequalities in the quantity they were presumably entitled to have run were not equalized within 30 days. According to the construction placed on the Oklahoma law by the Bureau, 10 producers may have been technically discriminated against for periods ranging from 3 to 26 days beyond the 30 days allowed by the law for adjusting inequalities. An examination of conditions, as revealed by the detailed tabulations covering the period from March 23 to May 11, inclusive (the period of the prorating system established by the pipe line company), shows that there were five producers who may have been technically discriminated against for periods ranging from 12 to 20 days.

The information contained in the tabulations of daily estimated production and the daily proportion of the oil each producer was entitled to have run under the pro rata system is not reliable enough to warrant definite conclusions in regard to discrimination between the different producers on the part of the pipe line company. Furthermore, there is some doubt concerning the meaning of the Oklahoma statute, and, as pointed out on page 62, the question of discrimination in the legal sense might hinge on the judicial interpretation of the law.

Section 9. Abandonment of the discrimination charges at the Corporation Commission hearing, May 1 to 6.

A statement was made on May 15, 1914, before the Committee on Interstate Commerce of the United States House of Representatives, by members of a delegation of Oklahoma producers, on the subject of discrimination between producers, which relates to the Corporation Commission hearing of May 1 to 6. W. B. Johnson addressed the committee on conditions in the Healdton field. In the course of his statement he complained about the methods of the Corsicana Petroleum Co. in continuing to drill its leases when there was an overproduction in the field. Representative O'Shaunessy, one of the members of the committee, asked a question, and the following colloquy took place:

Mr. O'SHAUNESSY. They bore a well on their land, and do they get rid of the oil?

Mr. JOHNSON. We caught them; we had evidence that they ran their pumps at night and pumped oil from their tanks into the main line.

Mr. O'SHAUNESSY. Into the pipe lines?

Mr. JOHNSON. Into the pipe lines.

Mr. O'SHAUNESSY. They can do that by secret processes, can they, without people knowing it?

Mr. JOHNSON. We caught them at it. Mr. Franklin caught them right in the act.

Mr. FRANKLIN. I think it might be well to state that we caught them right in the act of doing this very thing. Under the Oklahoma law it is a felony, and by reason of the fact that I caught them in the act we were able to get this compromise before the corporation committee. There was no other single fact that made them do that, because they were afraid of the criminal prosecution, and we believed that it was for the good of the country and for the good of the field; that it was wiser to take some concessions for the benefit of the whole people than to prosecute them.

Mr. O'SHAUNESSY. Just what does that law state about that?

Mr. JOHNSON. It makes it a felony for them to discriminate.

Mr. O'SHAUNESSY. You mean for the pipe line to discriminate in favor of one over or against another?

Mr. JOHNSON. Yes, sir. You see they are common carriers under our State law. But, you see, we could not do anything for this reason: They came into Oklahoma and took out a little charter, $500,000 capital, and built a line 40 miles long to the Texas line; then they called it the Magnolia Petroleum Co. on the other side of the river in Texas, so the extent of our jurisdiction was only in Oklahoma, you know. They very generously said, "We will transfer all the oil." We had no place to dump it except into Red River. [Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, May 15 and 16, 1914, pp. 44, 45.]

In response to an inquiry from the Bureau of Corporations to Wirt Franklin, counsel for the Ardmore Producers' Association, as to why other witnesses were not introduced in support of the charge of discrimination at the Corporation Commission hearing of May 1 to 6, Mr. Franklin, under date of July 20, replied:

* * * There was never any decision arrived at to withhold this testimony, but only not to go into it any further on that particular day, and devote the time on that day on other issues, which you will find disclosed by the record which you have. It was intended to further take up the question of discrimination the next day, but it was not done, the producers and the Magnolia Pipe Line Company having arrived at an agreement, which agreement was made the basis of the order of the Corporation Commission of May 7th, 1914, regarding the Healdton field. As you perhaps are aware the Corporation Commission appointed an Inspector or Umpire, Mr. Vernon Calvert, who has had charge of the prorating of oil since that time.

Prior to his appointment there was great discrimination among the different producers, but since that time, the prorating of oil having been taken out of the hands of the Pipe Line Company, there has been little difficulty.

In response to an inquiry from the Bureau of Corporations to George C. Greer, counsel for the pipe line company, as to whether the agreement was entered into with the producers in order to avert any prosecution of the company because of the charges of discrimination, he stated, under date of September 16, as follows:

* * * it is absolutely true that this charge did not influence us in the slightest in making the adjustment. I was prepared to meet and refute the

charge, and, as the record will show, I had begun to offer evidence on the subject when Attorney General West arose and suggested that I need not, or do not, (I've forgotten the exact language), introduce further evidence in that charge, and that the State would not, for the present at any rate, further urge it.

I then stated to him before the Commission that the charge was unfounded and unjust and I was prepared to meet it, and unless he waived it, I wanted to offer the evidence, and he was silent. I, and everyone, I am sure, present, construed his words and conduct to mean that the charge was abandoned. That all occurred *before* I suggested what we would try to do to relieve the situation, which suggestion ripened into the agreement.

As already stated, the only instance of discrimination charged by the producers which was considered at the Corporation Commission hearing was that involving the McMan Oil Co.'s Woodworth lease. The Dundee Petroleum Co. was merely mentioned as being the only other company which had a pump to force oil into the pipe line. Two witnesses were heard on behalf of the producers, Messrs. Franklin and Jennings, on May 1 and 2. One witness was heard on behalf of the pipe line company, R. M. McFarlin, on May 2. Later in the same day, when E. A. Latimer, manager of the Magnolia Pipe Line Co., was on the stand, George C. Greer, counsel for the pipe line, started to question him on the subject of discrimination for the producers. The attorney general protested against going into the subject at that time. The following colloquy[a] between Mr. Greer and Mr. Franklin thereupon took place:

Mr. FRANKLIN. We have about five witnesses here on that discrimination point and we have refrained from introducing that at all.

Mr. GREER. They asked you very extensively about it.

Mr. FRANKLIN. I know they did me, and I think the Attorney General concluded not to go into that after that.

Mr. GREER. We will drop that for the present then.

At the beginning of the afternoon session of May 4, Mr. Greer made a statement embodying what he considered to be the best the Magnolia Petroleum Co. and the Magnolia Pipe Line Co. could do to relieve the situation. In the course of this statement he made the following[b] reference to discrimination:

Now we do want another thing. We have been unjustly charged with intentional discrimination. With the knowledge that we have we feel that is very unjust. There has been no such purpose. Of course we don't mean to say that no matter what day you take that you won't find that some man is getting more than his share. That is, in the nature of things, inevitable, but there has been nothing but an honest purpose to run this oil fairly between the parties. Now we ask that this Commission appoint an inspector or representative you may speak of and we offer now to furnish the Commission half his expenses and if the producers wont furnish the other half we will pay all of his expenses not to exceed $150 a month. We do this for our protection because we

[a] Transcript of Corporation Commission hearing, p. 175.
[b] Transcript of Corporation Commission hearing, pp. 289–290.

have been unjustly charged and we find it a very difficult duty to discharge, and we are constantly hearing of threats that we are violating the law and that we are going to be penalized for it when we are not violating the law and do not intend to do so and we want this protection. We want the producers as between themselves to be dealt with fairly.

The terms of Mr. Greer's proposition were discussed at some length before the commission resumed the hearing of evidence in regard to the refining qualities of Healdton oil. At the morning session on May 5, the commission was informed that conferences among the producers and also between the producers and the pipe line company had been held on the night of May 4, preliminary to arriving at some agreement between the producers and the pipe line.

Toward the end of the morning session, on May 5, when Mr. Greer proposed to introduce the testimony of the pipe line company's gaugers, on the subject of discrimination, the attorney general again objected to going into the subject, and Mr. Greer dropped the matter with the following[a] statement:

Now, General, I don't want to be put in the attitude of saying or admitting that discrimination. We have done our best and we want it understood we are standing here ready to defend that now.

On May 6, after the agreement to have an inspector appointed to have charge of the prorating of the oil from the producers had been arranged, the following colloquy[b] in reference to the charge of discrimination occurred between Commissioner Henshaw and the attorney general:

Commissioner HENSHAW. I think we understand the proposition. Can you gentlemen answer that by the 10th of June, and file your answer and be ready to make your showing by that time?

Mr. WEST. That is, if this inspector is appointed that will attend to this particular complaint. I don't care particularly about their answering that now unless they want to.

Commissioner HENSHAW. You mean as to the discrimination?

Mr. WEST. I will hold out a pretty easy pardon on the discriminations if they stop. If they never existed the pardon is commutted. If they did exist I am willing to forget them forever.

Commissioner HENSHAW. If they didn't exist they would have no objection to following that suggestion.

Mr. WEST. If they didn't exist it cannot hurt them.

Section 10. The Bureau's conclusions relative to the subject of discrimination.

The Bureau found no evidence of any intent on the part of the pipe line company to discriminate between the different producers or against the oil produced on Indian allotments. The Bureau did find,

[a] Transcript of Corporation Commission hearing, p. 366.
[b] Transcript of Corporation Commission hearing, p. 480.

however, that at various periods some producers may have been favored at the expense of others. Under the law the pipe line company should either have taken the total production or should have prorated its purchases and equalized them within 30 days. In the case of most of the producers temporary inequalities were apparently corrected within the legal period. The unreliability of existing records relating to production and the unsettled question as to what legally constitutes discrimination preclude a positive statement in regard to the subject.

EXHIBITS.

EXHIBIT 1.

ORDER OF THE CORPORATION COMMMISSION OF OKLAHOMA, PRESCRIBING REGULATIONS GOVERNING THE HEALDTON FIELD.

CORPORATION COMMISSION OF OKLAHOMA.

ORDER No. 814 CAUSE No. 2041

State of Oklahoma, Plaintiff,
vs.
Magnolia Pipe Line Company, a corporation,
The Oklahoma Pipe Line Company, a corporation,
The Gulf Pipe Line Company, a corporation,
The Prairie Oil & Gas Company, a corporation,
The Texas Company, a corporation, Defendants.

APPEARANCES:
For the Plaintiff: Chas. West, Attorney General.
For the Producers: W. B. Johnson.
For the Defendants: Geo. C. Greer and A. C. Cruce.

By the Commission:

The complaint in this case was filed by the Attorney General on behalf of the State of Oklahoma, and alleged in substance that the defendants were engaged in a public business of transporting and purchasing oil as common carriers and common purchasers; that it was the duty of the defendant to pay a reasonable price for crude oil and to take the same from all producers without discrimination; that this duty had been violated and that they were paying a less price than the value of the oil and that they were discriminating in prices.

During the hearing, it was suggested by the Commission that the parties interested, the producers and the Magnolia Pipe Line Company, should confer with a view of reaching a basis or understanding upon which the business for the present could be conducted. As a result of this conference a tentative agreement was submitted to the Commission which provides in substance that within one week the Magnolia Pipe Line Company shall begin to take an average of eight thousand barrels of oil from the Healdton field daily; that on or before July the 1st, 1914, it shall begin to take a daily average of not less than twelve thousand barrels per day; that beginning October the 1st, 1914, if market conditions justify, it may take a greater amount than twelve thousand barrels per day; and that the taking of Healdton crude from the producers, if offered by them, in quantities as above indicated is to continue until April 1st, 1915, and as much longer as market conditions justify; and providing that, the agreement of the Pipe Line Company is not to be construed as having been violated if it is temporarily prevented from performing the same by strikes, fires, floods or other

causes over which it has no control. It is also provided by said agreement that if the price of oil should be fixed hereafter without the consent of the Pipe Line Company it shall not thereafter be further bound to take oil under the agreement; that the Magnolia Pipe Line Company shall take four 55000 barrel tanks heretofore purchased by the certain members of the Ardmore Oil Producers Association and pay said members the cost therefor and erect them in the Healdton field, to be immediately used by the Magnolia Pipe Line Company to clear the leases of all stock of accumulated oil that is in a merchantable condition the owners of said oil to be paid for same upon delivery at the rate of fifty cents per barrel for quantities delivered. It is also provided that the Commission may relieve the Pipe Line Company from the necessity of connecting with any new wells within six month from date hereof, except—

First: Those necessary to meet existing offsets; and,

Second: Those, the drilling of which is made necessary because of lease conditions, unless said Pipe Line Company shall sooner elect to take the entire production from the Healdton field.

It is further provided that should any dispute arise as to what wells should be connected, the President of the Ardmore Oil Producers Association is made the umpire to determine said question with the right of any party aggrieved to appeal to the Board of Directors of the Ardmore Oil Producers Association whose decision shall be final; and that the President of said Association shall have authority to make such exceptions to the rule as justice and equity among the different producers of the field may require and that said Association and its officers shall act for any producer not a member of the Association in this behalf; all of which regulation is subject to the right of any party to resort to the Corporation Commission or the Courts for further relief.

Said agreement further provides that the defendant, the Magnolia Pipe Line Company, is to provide connection and loading facilities at or near Addington, Oklahoma, on the main line of the Chicago, Rock Island & Pacific Railway Company, and to establish a reasonable rate for the transportation of oil from the Healdton Oil Field to said point, and to transport oil when offered in carload lots.

The stipulation also contains a provision in reference to the testing of oil in the Healdton Field and for the appointment of an inspector by the Commission at a salary not to exceed $150.00 per month, one half of which is to be paid by the Magnolia Pipe Line Company and the other one half by the producers.

The Attorney General objected to the provision in the tentative agreement which provided: "if hereafter the price of said oil is fixed without the consent of the said Pipe Line Company, it shall not, thereafter, be further bound to take oil under this agreement."

The Pipe Line Company objects to entering into an agreement whereby it is required to take any stipulated amount of oil unless it is free to voluntarily fix the price thereof, and as we understand, it will not consent to any stipulation which may be construed as an agreement of record or as a contract containing requirements to that effect.

The Attorney General will not agree upon behalf of the State to waive directly or indirectly, any rights the State may have or to compromise said rights which may be construed to be on a basis of bargain and sale.

The respective parties agree that an order, substantially as follows, will be acceptable to all interested parties.

It is hereby ordered that the defendant, the Magnolia Pipe Line Company, shall, within one week from May the 5th, 1914 begin taking a daily average of

eight thousand barrels of oil from the Healdton Field and on or before July the 1st, 1914, and until April the 1st, 1915, shall not take less than a daily average of twelve thousand barrels of oil from said field, and shall immediately erect four 55000 barrel steel tanks in the Healdton Oil Field, and that in addition to the daily averages of oil above mentioned it shall, as per said agreement, clear the leases of all stock of accumulated oil which is in a merchantable condition and pay the owners of same upon delivery at the rate of fifty cents per barrel for quantities delivered.

The Magnolia Pipe Line Company is hereby relieved as a common purchaser, from the necessity of connection with any new wells within six months from the date of this order, except—

First: Those necessary to meet existing offsets; and,

Second: Those, the drilling of which is made necessary because of lease conditions.

Third: Those who have leases and no producing wells should be permitted to connect up with one or two wells within the six months.

Fourth: All parties should be permitted to drill wells and connect, which in justice and equity should be done, based on the following considerations:

Where lease owners or lease holders have property which may be drained by the producing wells although there may be no wells in the immediate vicinity of such property; also in cases where contracts have heretofore been made for drilling or the financial condition of the parties interested may be such that bankruptcy would necessarily result if the properties were tied up for six months or longer before connections could be made.

These things must be considered and no injustice or inequity must be done any one. Yet, the principle of limiting the development so as to prevent waste of oil should be preserved and in so doing it may be necessary for all, to sustain some inconvenience. Should the Pipe Line Company sooner elect to take the entire production from the Healdton Field, the above requirement shall become null and void.

It is further ordered, that the Magnolia Pipe Line Company shall provide at its own expense, a pipe line connection and loading facilities at or near Addington, Oklahoma, on the main line of the Chicago, Rock Island & Pacific Railway Company and establish a reasonable rate per barrel for the transportation of oil from the Healdton Field to said point, when offered for such transportation in carload lots.

It is suggested that the President of the Ardmore Oil Producers Association be made the umpire to settle all disputes as to which wells shall be connected, and should any party or parties insist upon being connected to the pipe line who may be excluded under the above conditions, he or they, shall apply to the Commission for a modification of this order.

This order shall remain in full force and effect until April the 1st, 1915, and in the meantime the investigation as to quality, value and price to be paid for oil, may continue. But should the Commission, during the life of this order issue an order fixing the price of oil in the Healdton field, this order will become void, upon the effectiveness of such order fixing prices.

Vern Calvert is hereby appointed as an inspector in the Healdton Oil Field, with full authority to investigate all runs of oil, investigate the production of all wells and the amount of oil which should be taken from each producer, so as to prevent any discrimination and shall immediately advise the pipe line company of his conclusions, which shall be in writing, and a copy of which shall be sent to the Commission; and upon the failure of the pipe line company to so take oil from the different producers, the said inspector shall imme-

diately notify the Corporation Commission, and should any party feel aggrieved in that a just proportion of his oil is not being taken under the above arrangement, he shall immediately report the same to the Commission. Said inspector is appointed upon the condition contained in the agreement that his salary should be fixed at $150.00 per month, one half of which is to be paid by the producers and one half by the Magnolia Pipe Line Company, and that in no event should the State become liable for any portion of his salary or expenses; and that said inspector is appointed upon request and recommendation of the oil producers in the Healdton Field.

CORPORATION COMMISSION.
J. E. LOVE, *Chairman.*
GEO. A. HENSHAW, *Commissioner.*

Attest:

J. H. HYDE, *Secretary,*
Oklahoma City, May 7, 1914.

EXHIBIT 2.

REPORT ON THE GRAVITY AND GENERAL CHARACTERISTICS OF HEALDTON, OKLA., CRUDE OIL BY H. L. WOOD FOR THE CORPORATION COMMISSION OF OKLAHOMA, MARCH 13, 1914.

Hon. GEORGE A. HENSHAW,
Commissioner.

In compliance with your instructions, I have made an investigation of the conditions existing in the oil field in Carter County, commonly known as the Healdton field, and submit a summary of those conditions, including a gravity test of the crude produced from practically every property, the crude tested coming fresh from one or more wells on each lease, from flow tanks, storage tanks and sump holes. The object sought in taking the gravity was partly to determine the per cent of deterioration of the crude after exposure to the air, as much of the production of the field has been held in tanks some days awaiting completion of the pipe line and the storage tanks of the pipe line company.

GRAVITY TESTS OF WELLS AND TANKS.

Paraffine Oil Company.—Forty acres in section 8, township 4, range 3, Carter County; two wells completed, one 1,040 feet and one 1,103 feet deep, one flowing, one pumping; sample taken from flow tanks from which the oil is run into the pipe line, the crude taken within 24 hours after coming from the well. Hydrometer reading, 34¾ degrees Baumé, temperature 48 degrees Fahrenheit; corrected gravity, 32.9 degrees.

Twin State Oil Company.—Arrington land, well No. 2, section 8–4–3; depth of well 943 feet; sample taken from flow tank which daily runs are made. Hydrometer reading, 31¾ degrees, temperature 46 degrees; corrected gravity 32.8 degrees. Sample taken 48 hours old; hydrometer reading, 31¼ degrees; temperature, 46 degrees; corrected gravity, 32.4 degrees.

1911 Oil Company.—Woodworth land, section 32–3–3; well No. 1, 1,120 feet deep; hydrometer reading, 30.9 degrees, temperature 61 degrees; corrected gravity, 30.9 degrees. Well No. 2, top of sand 1,057 feet, bottom of hole 1,117.6;

hydrometer reading, 31.4 degrees, temperature 60 degrees—normal—corrected gravity, 31.4 degrees. Sample taken from 1,600-barrel tank 30 days old; temperature 49 degrees, corrected gravity, 29.7 degrees. Sample taken from ground reservoir 90 days old in open air; temperature 48 degrees; gravity, 21 degrees.

McMan Oil Company.—Woodworth land, section 32–3–3; No. 1 well, hydrometer reading 33.6 degrees, temperature 52 degrees; corrected gravity, 34.1 degrees. Well No. 2, hydrometer reading 33.7, temperature 52 degrees; corrected gravity, 34.1 degrees. Top of sand 840 feet, bottom of hole 875 feet. Initial production, 1,800 barrels, now making 1,200 barrels.

Ideal Oil Company.—Scoggins land, section 32–3–3; well No. 1, 955 feet deep, initial production 1,000 barrels, now making 450 barrels. Hydrometer reading, 34.1 degrees, temperature 54 degrees; corrected gravity, 34.5 degrees.

Producers Oil Company.—N. E. Dawson land, section 32–3–3; well No. 1, top of sand 1,035 feet, bottom 1,088 feet, production 400 barrels. Hydrometer reading, 30.6 degrees; temperature, 53 degrees; corrected gravity, 31 degrees.

Gunsburg & Forman.—Westheimer & Daube land, section 9–4–3; well No. 1, 1,010 feet deep, production 300 barrels. Hydrometer reading, 32.6 degrees; temperature 61 degrees; corrected gravity, 32.6 degrees.

Red River Oil Company.—The discovery well of the field was Franklin No. 1, Franklin land, section 5–4–3, in the 900 foot sand, initial production 270 barrels. A sample of oil from this well could not be secured, but a sample was taken from tanks into which Nos. 1, 2, 3, 4 and 5 wells are flowing, the gravity showing on an open reading of the hydrometer 31.1 degrees, the temperature registered at 49 degrees. Fresh from the well No. 1 showed an open hydrometer reading of 32.1,

Crystal Oil Company.—This company's lease in section 5–4–3, about the center of the field, has two gas wells completed, one registering approximately 50,000,000 cubic feet volume and 275 pounds pressure. The oil well has considerable gas coming with the oil. A sample taken from the tank holding crude gravitied from the flow tank, a week old, showed a temperature of 60 degrees (normal) and a specific gravity of 29.8 degrees.

Humble Oil Company.—J. C. Smith land, section 4–4–3, gravity 30.9 degrees; No. 1 in section 9–4–3, 32.4 gravity; C. R. Smith land, section 9–4–3, 31.3 degrees gravity.

Ardhoma Oil Company.—Section 9–4–3, No. 1 well shows a gravity of 33.4 degrees.

Rex Oil Company.—Hicks No. 1, section 9–4–3, 31.4 degrees gravity.

Westheimer & Nichols.—C. R. Smith land, section 9–4–3, 29.6 gravity after standing several days.

Twin State Oil Company.—Bess Tucker land, section 36–3–4, Jefferson county, the western well of the field, was being tubed and a sample could not be obtained, but an unofficial test showed a gravity between 29 and 30 degrees.

PIPE LINE AND STORAGE TANKS.

The crude of varying gravities is all run into the storage tanks of the pipe line company at its pumping station, an open test of which showed a gravity of 31 degrees. The crude thus mixed, when started into the pipe line for pumping south into the main line in Texas and on south gets away at a gravity shading under 31 degrees Baumé.

At the date of tanking the temperature and specific gravity tests in the Healdton field approximately half of the production of the field takes the $1.05

price and half of it is under 32 degrees gravity and takes the 70 cent price. The pipe line gauger takes an open hydrometer reading for temperature and gravity, indicated on the run tickets where it is below 32 degrees, and the corrected gravity according to the manual is computed by the office force of the pipe line company and each producer is credited accordingly, which is the only practical manner of taking tests and computing the price, and is satisfactory and customary where the gravity basis is adopted, a representative of the producer being present when the gauge and test are made and entered on the run ticket.

SUPERFICIAL RATING OF THE QUALITY.

Only a refinery run test or a chemical analysis of the crude oil produced in the Healdton field can exactly determine the exact value of the crude, but the hydrometer tests made from the crude fresh from the wells, from crude after standing in tanks from 24 to 48 hours and after it has stood seven to ninety days indicate that the oil lacks vitality and that it goes to pieces very rapidly, meaning that the specific gravity drops quickly until the volatile ingredients are lost, leaving it rather dead, thick and sticky. There is very perceptible sulphur odor noticeable over the field, like the heavy crudes produced in Texas, Louisiana, Mexico and California—the so-called fuel oils of commerce; a few of the wells showing lighter gravities give off a sweet odor, like most of the regular refining crudes. These superficial data also indicate that the Healdton production can easily be rated as a fuel oil in contradistinction to a refining oil, as even the lighter gravity crude appears to deteriorate very quickly after being brought to the surface and undergoing the handling from tank to tank and moving through the lines. When exposed to the air it thickens and gets sticky.

A very noticeable feature of the field is the abnormally low temperatures of the crude as it comes from the wells, registering as low as 46 degrees Fahrenheit, ranging up to 48, 52, 54 and 62 degrees, only two of the samples tested registering the normal temperature of 60 degrees, two 61 degres and one 64 degrees. Superficially this low temperature indicates a lack of kerosene, naphtha and gasoline, which give the vitality to crude oil, their absence creating the density of the fluid which makes fuel oil.

The heavy gas of the field appears to be in the center of the present producing area and it partakes somewhat of the characteristics of the crude oil from which it rises, but, lacking an analysis for heat units, its comparative value cannot here be approximated.

DEVELOPMENT OF THE FIELD.

As it stands on this date, the producing area is located in section 5, section 4, section 8, section 9 and section 32, in the northwest portion of Township 4 south and Range 3 west, Carter County, section 32 being in the southwest corner of Township 3 south and range 3 west; the one well in Section 36, Township 3 south and Range 4 west being just over the line in Jefferson County.

On this date 47 wells have been completed, 37 of them producing oil, four producing gas, and six of them are dry. The daily production is approximately 6,800 barrels. There are 43 wells drilling and 37 rigs up and building waiting for tools to be released from drilling wells.

The Magnolia Pipe Line Company has two 55,000 barrel steel tanks full of oil and is getting its pumping station adjusted, having pumped 5,000 barrels through the line in 24 hours. This pipe line is six inch from the pump station located in section 3-4-3, east of the field, to Addington, a distance of 26 miles, and from there to its junction with the main line in Texas, near Bowie, Texas, is eight-inch. The normal capacity of the six inch line is 16,000 barrels every 24 hours, but the initial station as above would be pushed to handle that much regularly every 24 hours a distance of 60 miles.

The Magnolia Petroleum Company of Texas, operating the trunk line from Electra to Beaumont, has one eight-inch line, is about completing three additional pumping stations, and is running regularly 11,000 barrels a day from Electra. This crude being of a fine refining grade, it will be given the preference over the heavier and less valuable crude from the Healdton field, which means that the six inch line out of the Carter County field has a maximum carrying capacity against the Texas main line of not to exceed 9,000 barrels in 24 hours, with the regular quantity handled, as at present situated, rather under that figure.

Anticipating a congestion, the Magnolia Pipe Line Company (an Oklahoma corporation), on Thursday, March 12, and several days before that date, notified the producers in the Healdton field that their production would be handled on a pro rata basis according to the average quantity produced from each lease, to be adjusted from time to time as the production of the field increased. This means that oil will stand in tanks for varying periods, only a portion of their contents being run each day. This, in turn, means that the contents of the tanks will lose in gravity and much of it fall below the 32 degree line between $1.05 and 70 cents. It means that wells will have to be shut in, reducing their production.

It is apparent at this time that the production of the Healdton field is likely to reach 12,000 barrels within 30 days, which means, as the pipe line facilities now stand, a surplus of 3,000 to 5,000 barrels a day, that, by standing, will deteriorate and lose part of its initial value.

Relations between the producers and the piping and purchasing company are becoming strained and will become more so as the field grows and the congestion and consequent shrinkage of value goes on. All crude oil produced at Electra and Petrolia, Texas, 60 to 100 miles southwest of the Carter county field, is sold for $1.05 per barrel. All of the crude produced in Oklahoma and Kansas, outside of the Healdton field, is quoted at $1.05. All of the heavy and fuel grades of crude produced in southwest Texas and southwest Louisiana are quoted at from 90 cents to $1.05 per barrel, most of it, as a matter of fact, selling at $1.06 to $1.08 under contract. Crude produced in the Caddo field in northwest Louisiana is bought on four grades—"crude" 75 cents; 32 gravity 90 cents; 35 gravity 95 cents and 38 gravity and better $1.05. A little crude at Corsicana, Texas, is bought on two grades—"heavy" 70 cents, "light" or 38 gravity at $1.05. Comparisons are made between these contiguous fields and their crudes and the Healdton field, the Healdton producers urging against the pipe line company that Healdton is being discriminated against both in price and the quantity of the production that is taken.

I believe that the facts and statements herein set out cover the situation now existing in the Healdton oil field, which I herewith submit.

Respectfully,

H. L. WOOD.

Oklahoma City, Okla., March 13, 1914.

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Exhibit 3.

AFFIDAVIT OF F. V. FAULKNER RELATING TO EARLY CONDITIONS IN THE HEALDTON FIELD.

State of Texas }
County of Dallas }

F. V. Faulkner, being duly sworn, says: I am Vice President and General Superintendent of Corsicana Petroleum Company and in charge of the drilling and operating of oil wells and securing of leases and oil territory. On August 19th, 1913, I left Wichita Falls, Texas, with L. Campbell, an employe of Corsicana Petroleum Company, in an auto. We travelled to Waurika, Oklahoma on that day. On August 20th we, together with Wm. Goodman, another employe, went in the auto to the Red River Oil Company well, the first producing well drilled in the Healdton field. We met Mr. W. Franklin there, also Mr. Critchelow (Jr.), the latter in charge of the property and who gave us permission to get a bottle of the oil. I filled a quart bottle from the well while pumping. We spent two or three hours at the well. Several other Companies had representatives at the well at that time. They had had oil at the well about two weeks, and on this day they had the well pumping. I inquired of Mr. Franklin in regard to how the land on which the well was located was held, also surrounding lands. Mr. Franklin informed us that his Company, the Crystal Oil Company, had held about 5,000 acres under ownership and oil lease in that neighborhood and had assigned to Red River Oil Company half of the acreage for the consideration of drilling a well. The acreage thus given was scattered quite extensively. It was my understanding that the particular tract on which the well was located was owned in fee by Apple and Franklin, and was leased by them in whole or in part to Crystal Oil Company and lease assigned among other leases to Red River Oil Company for drilling as above stated. Mr. Franklin stated the Crystal Oil Company had other lands under lease in the immediate vicinity and we talked with him about our securing territory from them. Their terms for an outright assignment were far beyond our ideas of value, but we thought we might get together on something in the nature of a partnership where we would furnish the money and take the risk of loss and divide the profits. We came to no conclusions on that date and made no offers but left the matter open for future negotiations. On two or three occasions after this and before September 5th, 1913, Mr. Campbell interviewed Mr. Franklin and other members of the Crystal Oil Company and on September 6th, 1913, Messrs. L. Campbell and W. L. Neill, another employe, and myself had a conference with the Crystal Oil Company in Ardmore. They represented that they had under lease about 2,300 acres, one-half of which they proposed to assign to us retaining a one-half interest in the portion thus assigned. We were to furnish all money, supplies, labor and to operate the property, giving them half of the profits and a cash bonus in hand of about $10,000, which we were willing to do; but an additional consideration guaranteeing to them a profit equal to one-fourth of the gross production (after royalty deducted) as asked by them made much more of a consideration than we were willing to concede, and the negotiations closed on that date, September 6th, 1913, and we have had no negotiations with them, that I know of, since. The quart bottle of oil spoken of above, I gave to Messrs. E. R. Brown and D. C. Stewart within the next day or two. I have had nothing to do with the getting of any oil from the well, except this one quart, at any time. I did not test that sample, nor have I ever had any of the Healdton oil tested.

They looked at the oil and smelled it and stated that it seemed similar to Electra oil. Several weeks afterward I inquired from D. C. Stewart as to the gravity of Healdton oil. He stated that it was 38 gravity. I afterwards heard it reported that the gravity was 34. This, I think, was several weeks after the above. The first chemical or refinery test I heard of was about March 1st, 1914, when Mr. Brown called me into his office and asked me if I knew that Healdton oil showed only about 30 or 31 gravity (I cannot remember which now), also that it was not a good quality for refining and virtually only a fuel oil. I told him that was news to me, as I had thought the oil was a better quality than that, although my knowledge was limited to the information stated above. I thought up to that time it was about of the quality of Electra oil, but of not quite the gravity.

F. V. Faulkner.

Sworn to and subscribed before me, a Notary Public, in and for Dallas County, Texas, this 27th day of October 1914.

[seal.] R. L. Holmes, *Notary Public.*

Exhibit 4.

AFFIDAVIT OF D. C. STEWART RELATING TO EARLY CONDITIONS IN THE HEALDTON FIELD.

State of Texas }
County of Dallas }

D. C. Stewart being sworn, deposes and says on oath that, he was during the year 1913, connected with the Magnolia Petroleum Company, being the Manager of its pipe line department and that he continued in the service of said Company up to about February 26, 1914, when his work with the Company was discontinued, and he went to China.

That the Magnolia Pipe Line Company was organized the latter part of the year 1913, and affiant was likewise connected with, and in the service of that Company up to his departure for China.

Affiant remembers that sometime after the first well in the Healdton field came in, Mr. F. V. Faulkner, Vice-President and General Manager of the Corsicana Petroleum Co., brought to Corsicana a sample bottle containing about one quart of the oil from the first well reported to have been brought in, in that field. Mr. Faulkner brought the oil into the office at Corsicana, and affiant saw the sample, and according to his recollection, it was left in the office of Mr. B. H. Stephens, Mr. Brown's assistant, and affiant does not know what became of it, and has no knowledge of any test of that sample having been made.

Affiant, sometime between the middle of August and first of September, 1913, visited the first well of the Healdton oil field, and of course, looked at it, and the oil produced therefrom, but did not at that time, take any sample of the oil, or test it.

Subsequently, about November 3, 1913, affiant, together with Sam Redd, Lease Agent of the Corsicana Petroleum Co., went to the Healdton oil field together, and affiant obtained a sample of the oil from the second well brought in, in that field, out of a 250 bbl. tank located near the well, and tested it

with a small hydrometer, and as affiant read the test at that time, (evidently erroneously), it showed to be 39 degrees gravity, and affiant, on such examination, reported to E. R. Brown and others, that the gravity of the Healdton crude, as shown by that test, was 39 degrees gravity, and the oil was similar to the Electra oil. Affiant, based on said test, in good faith believed the Healdton crude would range from 38 to 39 degrees gravity, and would compare favorably with the Electra oil.

This belief, as to the character of the oil, continued up to the time the affiant left America for China, and affiant did not know until after his arrival in China that the oil was of a different character and of a lower gravity, and of a quality inferior to the Electra oil, he having received this report by letter. Affiant further says that notwithstanding his report to E. R. Brown of the character and quality of the oil, Mr. Brown insisted that a sample of the oil be shipped to Beaumont Refinery for a Refinery test, and accordingly, a barrel of the oil was shipped under affiant's instructions, by E. A. Latimer, on the 20th day of January, 1914, said barrel of oil being long delayed in transit, and consequently the Refinery test intended was delayed.

Affiant does not know exactly when sample barrel reached Beaumont, but up to the time he left for China, he had not learned of its reaching its destination.

D. C. STEWART.

Sworn and subscribed to before me this the 5th day of November, A. D. 1914.

[SEAL.] W. L. HOLMES,

Notary Public in and for Dallas County, Texas.

EXHIBIT 5.

AFFIDAVIT OF E. R. BROWN RELATING TO EARLY CONDITIONS IN THE HEALDTON FIELD, AND LETTER FROM E. E. PLUMLY TO E. R. BROWN CONCERNING TESTS OF HEALDTON CRUDE OIL.

STATE OF TEXAS. }
COUNTY OF DALLAS. }

E. R. Brown, being sworn, says on oath that he is now and was during the year 1913 vice president and general manager of the Magnolia Petroleum Company.

Affiant says he has no definite recollection about the sample of oil—about one quart—to which Mr. F. V. Faulkner refers in his affidavit, but does remember that some sample of the Healdton Oil of a smaller quantity was, within a few months, perhaps within a few weeks, after the bringing in of the first well in the Healdton Field, turned over to him, and sat on his desk for some time. The sample referred to was in a small bottle and was not as large as that referred to in Mr. Faulkner's affidavit. It had water in the bottom and had the appearance of having been picked up out of a pit. Affiant remembers that sometime after the drilling in of the first well in the Healdton Field and perhaps after the drilling in of the second well, Mr. D. C. Stewart reported to him that the Healdton Crude was of about 39 gravity and appeared to be similar to the Electra Oil; and such was the understanding and belief of affiant with reference to the Healdton Crude up to the time that Mr. E. E. Plumly, manager of the refineries of the Magnolia Petroleum Company, made his report, dated February 25th, 1914, a copy of which is hereto attached, which was the first information affiant had concerning the actual quality and character of the Healdton Oil, being the first refinery test reported to affiant on the subject.

This report was a great surprise to affiant, as prior to that he had been relying upon the report of Mr. Stewart that the Healdton Oil was about 39 gravity and similar to the Electra Oil. A subsequent refinery test to the one referred to above, indicated the sulphur difficulty in the oil as well as its deficiency of gasoline and kerosene.

Upon receipt of the report of Mr. Plumly, of date February 25th, 1914, affiant sent John Ricker, one of the employees of the Magnolia Petroleum Company to the Healdton Field to sample and test the gravity of the oil coming from each well in that field. John Ricker did this and brought back samples which showed that the oil from the different wells ranged in gravity from about 29 to 34° Baumé and that there was not enough difference between the sample first tested by Mr. Plumly and the average oil produced from the various wells to justify any difference in price, situated as the Magnolia Pipe Line Company and the Magnolia Petroleum Company were. Upon receiving Mr. Plumly's first report, of date February 25th, 1914, affiant had the hope that there would be some substantial difference between that sample and the average oil in the field and there was, for a short time, a difference in price posted for oil of 32 gravity and under and that over 32 gravity, because it was not then clear that there was not enough difference between the sample tested and the other oil produced in the field from the other wells to justify a difference in price. Later on the sulphur difficulty appeared in all the oil from the Healdton Field and that, together with the fact that all the oil was, on an average, of a gravity of about 31° and deficient in the quantity of lighter products contained, rendered it necessary to post the same price for all the Healdton oil and abolish the differential that had formerly existed.

E. R. BROWN.

Sworn to and subscribed before me, this 2nd Day of November, A. D., 1914.

[SEAL.] W. L. HOLMES,

Notary Public, Dallas Co. Texas.

FEB. 25, 1914, BEAUMONT, TEXAS.

Mr. E. R. BROWN,
Corsicana, Texas.

DEAR SIR: We received the barrel of Healdton Crude which gave the following tests: Gravity 29.1, Flash 120, Burn 170, Color, Dark Green. Following are the cuts:

5%	Gravity	51.2	Temperature	349
5%	"	46.5	"	388
5%	"	43.2	"	436
5%	"	40.8	"	482
5%	"	38.7	"	526
5%	"	37.4	"	552
5%	"	36.5	"	568
5%	"	35.7	"	594
5%	"	34.8	"	614
5%	"	34.2		
5%	"	33.7		
5%	"	33.8		
5%	"	35.2		
5%	"	34.0		
5%	"	31.7		
5%	"	30.5		
5%	"	30.4		

I am disappointed in this crude, as I thought it was a light oil. From the above distillation tests, we would not be able to get over 5% of gasoline and 20 to 25% of heavy gravity refined oil.

Yours, very truly,

E. E. PLUMLY.

EXHIBIT 6.

LETTER FROM E. E. PLUMLY TO E. R. BROWN RELATING TO SULPHUR IN HEALDTON CRUDE OIL.

BEAUMONT, TEXAS, *Mar. 23, 1914.*

Mr. E. R. BROWN,
Corsicana, Texas.

DEAR SIR: On further investigating Healdton Crude, we find that it contains so much sulphur that I am really puzzled to know what to do with it. The crude itself contains .714% sulphur: this is not a free sulphur and does not pass off with the gas; therefore, the first 5% which can be put into naphtha contains .019% sulphur. This can be taken care of by mixing with naphtha from Electra Crude, which shows only .005% and naphtha specifications are .010% sulphur. The next 10% which we had figured on putting into 44 gravity water white oil, contains .183%, and the next 15% which would go into 42 gravity common oil shows .200%. We took the cuts from water white and re-run it as we would South Texas Crude to throw off the sulphur, and the first 10% over showed .106%; the next 80% showed .172% sulphur. The limit on water white oil is .040% and on common oil .065%. By this you can readily see what we are up against in trying to handle this oil. In my opinion Healdton Crude is absolutely a fuel oil proposition. The small per cent of naphtha which must be taken off in order to get sufficient flash for fuel oil will not pay the cost of reducing.

Yours, very truly,

E. E. PLUMLY.

EXHIBIT 7.

TELEGRAMS BETWEEN E. R. BROWN AND H. C. FOLGER, JR., RELATING TO SULPHUR IN HEALDTON CRUDE OIL.

CORSICANA, TEXAS, *Mar. 24, 1914.*

H. C. FOLGER, Jr.,
26 Broadway, New York.

Now find that the sulphur in Healdton crude is so high and expensive to remove from refined oil produced by it that it will not pay to run it except for naphtha and fuel oil. This makes it necessary to buy from six to eight thousand barrels of refinable crude per day elsewhere and it seems necessary, in addition to our previous plan of doubling line from Alvord to Fort Worth and erecting skimming plant to extend Magnolia pipe line to Cushing where there is an abundance of light crude. To do this we must in addition to increasing capital of Magnolia Petroleum Company as proposed, also increase capital of Magnolia Pipe Line Company to one million dollars paid up. Sealy, Greer and Plumly are here today and would like reply before night if possible.

Please Rush.

E. R. BROWN.

NEW YORK, *Mar. 24, 1914.*

E. R. BROWN,
Corsicana, Texas.

Quality Healdton crude a surprise. It would be well to have process which removes sulphur investigated to decide what best be done for refining it. Programme outlined in message so costly it should be considered only as a last resort. Cannot today even undertake to subscribe as suggested in your letter March 14th.

H. C. FOLGER, Jr.

EXHIBIT 8.

LETTER FROM E. R. BROWN TO E. E. PLUMLY DIRECTING A TEST TO BE MADE OF HEALDTON CRUDE OIL.

MARCH 26, 1914.

Mr. E. E. PLUMLY,
Beaumont, Texas.

DEAR SIR: As you will be running some of the Healdton Crude at the Corsicana plant within the next few days, would it not be a good plan on this first run to make a test to see in a practical way what can be done with the small amount of refined oil that you would get from it? In other words, run off probably 25% instead of 5% or 6%, treating the distillate and re-running it, making as accurate experiments as possible, to see what grade of oil you would get and as to the cost of running it. Unless we can get a small amount of refined oil from it we could not afford to pay 70 cents for the crude based on the present fuel market, and we should make every effort to get the most value out of the oil possible so as to be able to pay as high price as we can, compared to running the other lighter and sweeter oils.

Yours very truly,

E. R. BROWN.

EXHIBIT 9.

REPORT ON THE ANALYSIS OF HEALDTON CRUDE OIL, MADE BY M. C. WHITAKER TO THE UNITED STATES BUREAU OF MINES.

[The following report was made to the United States Bureau of Mines, and it is published with its permission.]

M. C. Whitaker, M. Sc. F. J. Metzger, Ph. D.

CONSULTING
INDUSTRIAL AND ENGINEERING
CHEMISTS

Broadway and 116th Street
New York City

REPORT ON THE ANALYSIS OF CRUDE OKLAHOMA PETROLEUM.

We received on May 29th, 1914, three sealed samples of crude petroleum described as follows:

(1) *Number 1470.* Lease, Silsanny Jones Allot—Dept. lease: Township, Sec. 4, T4S, R3W: Carter County, Oklahoma: Owner, Coline Oil Company, Ard-

more, Oklahoma: Well No. 1 located at extreme SW cor. N½ N½ SW S½ NW. Sampled by Irving C. Allen, May 23, 1914. Our laboratory number 14531.

(2) *Number 1464.* Million & Thomas Farm: Township, Sec. 5, T4S, R3W: Carter County, Oklahoma: Owner, Crystal Oil Company, Ardmore, Oklahoma: Well No. 3 located at extreme SE cor. of S½ of SE. Sampled by Irving C. Allen, May 23, 1914. Our laboratory number 14532.

(3) *Number 1469.* Apple-Franklin-Harrold Farm: Township, Sec. 8, T4S, R3W: Carter County, Oklahoma: Owner, Rex Oil Company, Ardmore, Oklahoma: Well No. 2. Sampled by Irving C. Allen, May 23, 1914. Our laboratory number 14530. [This specimen was not analyzed.]

No one method for the analysis of crude petroleum has been carefully investigated and adopted for universal use, as has been done in the case of many of our other analytical processes, and chemists are therefore at liberty to choose whichever method is the most convenient or available.

In order to establish the composition of these oils, we have analyzed and tested samples No. 1470 and No. 1464, by each of the four methods commonly described in the most recent books treating the subject of petroleum analysis. A fifth method known as Grey's method might have been added to this list, but it would have required a larger amount of oil, and the results would not have been materially changed. The methods we have used may be briefly summarized as follows:

First: Engler Method.—(See Allen's Commercial Organic Analysis, Vol. III, page 48, 1910.) Distill 100 cc. of the oil from a glass distilling flask of specified dimensions, collecting separately the fractions passing over between the following temperatures: below 150° C., 150° to 200°, 200° to 250°, 250° to 300°, above 300°. When the temperature reaches the maximum for each fraction, the source of heat is removed and the temperature allowed to fall 20° and then heated again to the maximum for the fraction. This process is repeated until no more distillate is obtained for that fraction. The temperature is then brought up for the succeeding fraction and the same practice of running up to the maximum and dropping back 20° is continued until the fraction is complete. The final temperature is carried up to the point at which coke only is left in the flask.

Second: Ubbelohde Method.—(See Allen's Commercial Organic Analysis, Vol. III, page 50, 1910.) Distill 100 cc. of the sample in a distilling flask of approximately the same dimensions as that used by Engler, but by a uniform and continuous application of the heat, collecting the various fractions between the temperatures as specified by Engler.

Third: Regnault Method.—(See Redwood, Petroleum and Its Products, Vol. II, page 536, 1906.) Distill 100 cc. of the sample from a metal retort connected with a metal condenser, water-cooled. The heat is applied uniformly and continuously, and the fractions are collected as in the Ubbelohde Method.

Fourth: Nawratil Method.—(See Allen's Commercial Organic Analysis, Vol. III, page 50, 1910.) Distill from a glass retort, uniformly and continuously heated, collecting the several fractions as already indicated. This method is used by many American chemists.

In order that our results might be comparable one with another, we have adhered to the temperature ranges indicated in the First or Engler Method, for the separation of the various fractions in all distillations.

ENGLER METHOD.

Sample No. 1470. Sp. gr. =0.8734 at 60° F. First drop at end of flask at 70° C.

Temperature, ° C.	Volume per cent.	Sp. gr. at 60° F.
Below 150	9.3	0.7467
150 to 200	9.0	0.7815
200 to 250	11.0	0.8173
250 to 300	12.7	0.8413
Above 300	52.9	0.8861
Coke	3.5	
Loss (gases, etc.)	1.6	

Sample No. 1464. Sp. gr.=0.8608 at 60° F. First drop at end of flask at 50° C.

Below 150	16.7	0.7361
150 to 200	8.2	0.7931
200 to 250	9.0	0.8206
250 to 300	11.1	0.8421
Above 300	50.5	0.8877
Coke	2.6	
Loss (gases, etc.)	1.9	

UBBELOHDE METHOD.

Sample No. 1470. First drop at end of flask at 60° C.

Below 150	5.2	0.7486
150 to 200	10.2	0.7750
200 to 250	11.0	0.8092
250 to 300	11.1	0.8331
Above 300	56.0	0.8798
Coke	4.8	
Loss (gases, etc.)	1.7	

Sample No. 1464. First drop at end of flask at 55° C.

Below 150	11.5	0.7265
150 to 200	10.7	0.7747
200 to 250	9.7	0.8130
250 to 300	10.4	0.8369
Above 300	53.5	0.8822
Coke	3.1	
Loss (gases, etc.)	1.1	

REGNAULT METHOD.

Sample No. 1470. First drop at end of condenser at 110° C.

Below 150	3.7	0.7458
150 to 200	10.4	0.7726
200 to 250	12.0	0.8053
250 to 300	12.4	0.8345
Above 300	56.0	0.8762
Coke	3.9	
Loss (gases, etc.)	1.6	

Sample No. 1464. First drop at end of condenser at 90° C.

Below 150	9.5	0.7289
150 to 200	9.6	0.7745
200 to 250	10.3	0.8083
250 to 300	11.3	0.8354
Above 300	53.5	0.8794
Coke	2.7	
Loss, (gases, etc.)	3.1	

NAWRATIL METHOD.

Sample No. 1470. First drop at end of retort at 90° C.

Temperature, ° C.	Volume per cent.	Sp. gr. at 60° F.
Below 150	2.8	0.7556
150 to 200	11.5	0.7750
200 to 250	11.3	0.8049
250 to 300	11.2	0.8322
Above 300	57.5	0.8798
Coke	4.0	.....
Loss (gases, etc.)	1.7	.....

Sample No. 1464. First drop at end of retort at 75° C.

Below 150	11.1	0.7372
150 to 200	8.6	0.7774
200 to 250	10.5	0.8059
250 to 300	11.1	0.8351
Above 300	52.5	0.8705
Coke	4.8	.....
Loss (gases, etc.)	1.4	.....

Chemists usually report the fraction distilling over below 150° C. as "Naphtha"; the combined fractions distilling between 150° and 300° C. as "Illuminating Oils"; that distilling above 300° C., as "Lubricating Oil." In the following tables the analyses have been grouped in the customary manner:

Sample No. 1470.

[Bracketed items in the following tables have been inserted by Bureau of Corporations in order to secure completeness of presentation.]

	Engler.	Ubbelohde.	Regnault.	Nawratil.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
"Naphtha"	9.3	5.2	3.7	2.8
"Illuminating Oil"	32.7	32.3	34.8	34.0
"Lubricating Oil"	52.9	56.0	56.0	57.5
[Coke	3.5	4.8	3.9	4.0
[Loss	1.6	1.7	1.6	1.7
[Total	100.0	100.0	100.0	100.0

Sample No. 1464.

	Engler.	Ubbelohde.	Regnault.	Nawratil.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
"Naphtha"	16.7	11.5	9.5	11.1
"Illuminating Oil"	28.3	30.8	31.2	30.2
"Lubricating Oil"	50.5	53.5	53.5	52.5
[Coke	2.6	3.1	2.7	4.8
[Loss	1.9	1.1	3.1	1.4
[Total	100.0	100.00	100.0	100.0

A comparison of the results obtained shows a wide discrepancy in amounts of the various products obtained by the several methods of analysis, and this difference is especially great in the case of the "naphtha." On sample No. 1464 about one and three-fourths times as much "naphtha" is obtained by the Engler method as by the Regnault method, whereas in sample No. 1470 the "naphtha" obtained by the Nawratil method is less than one-third that obtained by the Engler method. The variations shown in the analysis of your oils by the different methods are directly in accord with our previous experience, extending over a number of years. We do not consider any of the existing methods as dependable. It is doubtful if any of these methods will give results even approximating those attained in practical distillation. We frequently encounter disputes between producer and refiner as to the proper evaluation of an oil, due to a difference in results obtained by different methods of analysis. We have frequently urged, and still urge, that the whole question of crude oil analysis and method of valuation be subjected to the most thorough investigation with a view to establishing a standard method of analysis and report. Such a method would be promptly adopted by the chemists, as was the case in the standardized methods of coal analysis, with the result that specifications may be drawn with fairness to producer and purchaser, and deliveries checked by both parties with reasonable accuracy.

The commercial value of the transactions in crude petroleum would justify the establishment of investigation into the methods of evaluation on a broad plan. The investigation should not be limited to a few laboratory comparisons of methods, as has been done in the past, but should be taken up with the producers, refiners and chemists, with a view to correlating their problems and interests.

Respectfully submitted.

M. C. WHITAKER.

EXHIBIT 10.

STATEMENT OF THE MAGNOLIA PETROLEUM CO., SHOWING AN EXPERIMENT WITH 45 GALLONS OF HEALDTON CRUDE IN DETERMINING WHETHER OR NOT CYLINDER OILS CAN BE IN A PRACTICAL WAY MANUFACTURED FROM HEALDTON CRUDE FOR COMMERCIAL PURPOSES.

1-barrel from Corsicana

Run #9
Grav: 30.6.flash below 60°
Pour O. Color, Black Green
Sulphur, .638

45-Gallons of this crude oil was treated as follows:

2-Lbs. per bbl. of settling acid—1/2 hour agitation—1 hour settling drew off 1/2 gallon of sludge.

1st dump: 10 lbs. of acid—45 minutes agitation—3 hours settling drew off 7 gallons of sludge.

2nd dump: 5 lbs. of acid—45 minutes of agitation—10 hours settling drew off 2 1/2 gallons sludge.

Transfer to other agitator and wash with water—2 still washes and four slow agitation washes, each of 1 hour duration. Great trouble was encountered in these washes, due to emulsification. Time required for wash water to settle out was 24 hours.

Neutralizing with lye was very hard—four times the amount of total lye used for treatment of oil was required to bring oil into lyesids. Strength of lye used was 20 Be'L. It was given in four dumps—settling 24 hours—draw off 2 gallons of lyesoap.

5 Water washes of ordinary temperature and 5 at 120 F. were required to wash out lye: each wash taking 1 hour slow agitation and 24 hours settling. The same trouble of emulsification, as found in washing out acid was encountered in washing out lye.

Loss in treatment of this batch amounted to 33 1/3%.

Considerable trouble experienced with former treatments of Healdton Crude seem to justify the statement that it is not practical to treat this crude on large scale.

27 Gallons of This Treated Crude Oil were run for Cylinder Oil. Treated Crude—Gravity 29.0: Flash 130 O. C. Pour 15. Sulphur .602: Color Blue-green.

Cut	Per cent.	Temp	Grav	Flash	Vis	Chill	
1	5	430	47.9				20% Kerosene, Grav 43.7 Flash 120 OC Fire 150 O.C. Sulphur .161
2	"	485	44.8				
3	"	510	42.2				
4	"	530	40.0			8	
5	"	548	38.5			22	
6	"	560	37.0			36	20% Gas Oil Distillate. Grav 36.0 Flash 205 Pensky Martin. Sulphur .385. Pour 40.
7	"	580	35.7			42	
8	"	588	34.2			50	
9	"	592	32.2	310	58	58	
10	"	598	30.3	325	72	62	
11	"	602	29.1	345	97	76	30% Nondescript Oil, Grav. 28.1 Flash 295 OC. Vis 129 at 100S. Pour 70. Sulphur .696.
12	"	612	27.0	305	158	82	
13	"	634	26.0	245	250	84	
14	"	648	25.2	240	320	88	

Bottom 30% of Cylinder Oil.
Grav. 17.1
Flash 535
Fire 615
Vis. 411 at 212
Pour 40.
Odor, Sulphurous
Color, Blueish green
Appearance, sticky, stringy pulpy.

This last part is worthless for anything except fuel oil for home consumption or for thinning out heavy residues. Only an elaborate and non-paying process could convert it into either gas oil or lubricating distillate. Also the paraffine could not be extracted without the extra run which would be necessary for the manufacturing of either of the abovementioned grades.

Total Contents of Treated Crude Oil.
20% Kerosene
20% Gas Oil
30% Nondescript Oil
30% Cylinder Oil.

100 %

Note by Bureau: Yield of Healdton crude oil, shown in percentages of the volume of the crude refined:

	Per cent.
Kerosene	13.33
Gas oil	13.33
Nondescript oil	20.00
Cylinder oil	20.00
Loss	33.34
	100.00

EXHIBIT 11.

STATEMENT OF THE MAGNOLIA PETROLEUM CO., SHOWING AN EXPERIMENT WITH 1 BARREL OF HEALDTON CRUDE FOR THE PURPOSE OF DETERMINING IF ENGINE OILS CAN BE MANUFACTURED THEREFROM.

1-BARREL HEALDTON CRUDE FOR CORSICANA, GRAVITY 30.6.

Cuts	Per cent	Temperature		Grav	Chill	
		Still	Vapor			
1	2.5	360	260	61.0	—	Naphtha 7½%.
2	"	390	290	58.1	—	
3	"	420	330	55.2	—	
4	"	450	360	51.6	—	Light end, Common Oil 2½%.
5	"	470	380	48.7	—	
6	"	500	400	46.8	—	
7	"	520	420	45.1	—	Water White Stock, 15%.
8	"	540	440	43.3	—	
9	"	560	460	41.8	—	
10	"	590	490	40.5	—	
11	"	600	510	39.5	—	Heavy End, Common Oil 7½%.
12	"	619	520	39.0	—	
13	"	634	534	37.9	—	
14	"	650	559	37.5	—	
15	"	—	562	36.5	—	
16	"	—	563	36.5	16	
17	"	—	565	36.7	18	
18	"	—	570	36.8	22	
19	"	—	571	36.7	18	Gas Oil Dist. 27.5%.
20	"	—	572	35.6	26	
21	"	—	573	34.4	26	
22	"	—	589	34.1	26	
23	"	—	595	34.5	26	
24	"	—	591	35.2	26	
25	"	—	591	35.2	28	
26	"	—	591	36.5	32	
27	"	—	591	38.5	40	
28	"	—	591	37.5	32	
29	"	—	592	36.5	70	
30	"	—	593	37.0	42	30% Paraffine Dist, Grav. 33.1, Pour 40.
31	"	—	593	37.5	70	
32	"	—	597	35.3	82	
33	"	—	600	32.5	76	
34	"	—	600	32.2	84	
35	"	—	600	32.1	86	
36	"	—	600	30.9	90	
37	"	—	600	18	112	Wax Tailings, 2½%.
Bottom						Coke, 4.72%, 13¾# Loss, 2.78%.

The paraffine distillate was run in 1-barrel still: overhead 41.07%, gravity 40: *Bottom*, 58.93% Heavy Oil & Paraffine, gravity 27.0: Flash 325, viscosity 77, Pour 60.

Bottom pressed over at 40° F.=92.74% Lub. Distillate, gravity 27.0, Flash 325, Viscosity 77, Pour 35.

Slack Wax 7.26%, M. P. 112.

Slack wax treated with 10# acid: sweated to M. P. produced 63% of Foots Oil and 37% of 128 M. P. Wax.

The 92.74% Lube. Distillate gave the following:

Cut.	%.	Temp.	Grav.	Flash.	Vis.	Chill.	
1	5	600	31.5	270	42	46	
2	5	605	30.4	275	45	46	All overhead cuts mixed for Pale Oil
3	5	610	29.6	275	49	48	Grav. 28.2 Flash 310
4	5	615	28.1	280	54	46	Vis. 72 Chill 46
5	5	620	27.9	285	56	44	
6	5	622	27.5	290	57	46	Treated with 10# 66 Acid
7	5	625	27.4	300	59	48	Grav. 28.2 Flash 310
8	5	628	27.3	305	60	46	Vis. 60 Chill 50
9	5	630	27.2	310	61	46	Color 890
10	5	635	26.9	315	62	46	
11	5	630	26.8	320	66	48	
12	5	630	26.2	330	74	46	
13	5	630	26.1	335	82	44	
14	5	635	25.8	340	96	46	
15	5	640	25.4	345	96	46	

Bottom, 25% Grav. 22.3, Flash 390, Vis. 189, Pour 35. (Color A Re[d])

Treated with 15# of 66 Acid=Grav. 22.4 Flash 39.0 Vis 142, Chill 46.

PARAFFINE DISTILLATE THATS WORKED UP=12.30% of overhead of H. O. & P. 12.30% Pale Oil, 4.10% Red Oil, 0.82% Foots Oil .48% Finished Wax.

Note by Bureau: Yield of Healdton crude oil, shown in percentages of the volume of the crude refined:

	Per cent.
Naphtha	7.50
W. W. 150	15.00
Common oil	10.00
Gas oil	12.32
Foots oil	.81
Pale oil	12.30
Red oil	4.10
Finished wax	.47
Fuel oil	27.50
Wax tailings	2.50
Coke	4.72
Loss	2.78
	100.00

EXHIBIT 12.

MAGNOLIA PETROLEUM COMPANY STATEMENT OF COMPARATIVE REFINING COSTS (FIGURES TAKEN FROM CORSICANA REFINERY MONTHLY STATEMENTS).

MARCH, 1914.

Electra crude run, gallons	2,225,201		
Corsicana light crude run, gallons	258,203		
Total crude run	2,483,404		
Refined oil and naphtha cut from total crude run:			
Refined oil, gallons	760,966	30.64%	
Naphtha, gallons	640,598	25.80%	
Cost of distillation, $7,907.37.			
Cost of distilling 1 gallon		$0.005641	
Cost of treating 1 gallon		.001885	
Cost of steam stilling 1 gallon		.000404	
Total manufacturing cost 1 gallon refined oil and naphtha		.007930	$0.007930

APRIL, 1914.

Electra crude run, gallons	90,707		
Healdton crude run, gallons	4,097,904		
Corsicana light crude run, gallons	74,198		
Total crude run	4,262,809		
Refined oil and naphtha cut from total crude run:			
Refined oil, gallons	917,190	21.52%	
Naphtha, gallons	565,278	13.26%	
Total cuts	1,482,468		
Cost of distillation, $9,318.59.			
Cost of distilling 1 gallon		$0.006285	
Cost of treating 1 gallon		.001865	
Cost of steam stilling 1 gallon		.000480	
Total manufacturing cost, 1 gallon refined oil and naphtha		.008630	
The 917,190 gallons refined oil shown above was pumped to Beaumont and re-run and treated again at an estimated cost of $4,585.95. This amount figured against the total cuts shown above, 1,482,468 gallons		.003093	
Or a total manufacturing cost per gallon of product of		.011723	.011723
Difference in cost, March and April			.003793

which is equal to the cost of removing the sulphur from 1 gallon of refined product from Healdton Crude.

Exhibit 13.

AFFIDAVIT OF C. R. STEWART RELATING TO THE PIPE LINE COMPANY'S METHOD OF TAKING OIL FROM THE HEALDTON FIELD.

State of Oklahoma }
County of Carter }

C. R. Stewart being duly sworn, deposes and says on oath that he is now the Field Manager for the Magnolia Pipe Line Company in the Healdton oil field, situated in Carter County, Oklahoma, and has been such since said pipe line was completed about March 1, 1914.

That the duties of affiant require him to look after the operations of the pipe line in said field, including the receipt, shipment and pro rating of the oil purchased from producers in said field.

That E. A. Latimer has been during said period, General Manager of the Pipe Line Company, and instructed affiant when the oil produced in that field became greater in quantity than the pipe line could receive and transport, to pro rate the oil purchased and received from the producers fairly and proportionately between the producers according to their respective productions, in accordance with the laws of the State of Oklahoma, and such has been the honest purpose and effort of affiant and, his instructions to the gauger, Mr. Edington.

That up to about March 23, 1914, the production had been, in the judgment of affiant and others in charge of said pipe line, such that the Pipe Line Company could receive and handle all of it and, therefore, the Pipe Line Company was up to that date endeavoring to take, and took as far as practical, the entire current production (not including the stock oil), deeming such course a fair and substantial compliance with the Oklahoma statutes.

That, of course, as necessarily was the case the Pipe Line Company took the production that was taken, both before March 23rd and after from the various producers by turns, receiving from one of them today the oil in his measuring tank, and from another tomorrow, and so on; it being the common custom in the oil fields not to take a fractional part of the measuring tank when a run was taken, but all of it.

That in so doing, of course a producer who had a large measuring tank might, for the time being, have more than his proportionate part of the oil run for that particular day; but by the time the oil of other producers was run and his turn came around again he would probably be behind.

That about March 23, 1914, the production of the Healdton oil field had increased to a point and other conditions had arisen to make it impossible for the Magnolia Pipe Line to take all of the production of the field and it was forced to take a fractional part.

That affiant, as Field Manager, honestly endeavored to run, and has so far as practical since that date run the oil of the various producers proportionate.

That of course inequalities between the producers have existed on various dates but the same have been "evened up" and corrected at regular intervals in accordance with the law of Oklahoma on the subject, which allows thirty days for said purpose.

That, notwithstanding thirty days' time is allowed for the purpose of equalizing production between the producers, yet affiant and every one in charge of said pipe line, so far as affiant knows and believes, has at very much shorter intervals equalized the production between the producers, that is to say; at periods of four or five days.

That it has been, and in the judgment of affiant, will continue to be a physical impossibility to pro rate oil in a field like Healdton, or in any one field where the production is changing, with anything approaching absolute accuracy for the reason that the production is changing to a great extent from day to day by the bringing in of new wells and the falling off of old wells, and the producers themselves to a large extent either do not know or inaccurately estimate their own productions; most of them being disposed to exaggerate for the purpose of getting as much of his oil run as possible.

Affiant especially denies that any intentional favoritism was shown to either the McMan Oil Company or the Dundee Petroleum Company, and so far as affiant knows and believes they did not enjoy for any prohibited period more than their proportionate part of the runs, all regularities in favor of or against them being corrected and equalized, at short periods estimated not to exceed one week.

That so far as this affiant knows and believes no intentional discrimination against or in favor of any one has been shown by any of the officers or employees of the Magnolia Pipe Line Company.

Since about May 5, 1914, the oil in Healdton oil field has been purchased and run from the various producers in accordance with the advice and instructions of Mr. Verne Calvert, Official Inspector of the Healdton Oil Field, appointed by the Corporation Commission of Oklahoma, at the instance and with the concurrence of both the producers and the Magnolia Pipe Lines, for the purpose of fairly and justly pro rating the runs of oil from the various producers in that field.

C. R. Stewart.

Sworn to and subscribed before me this 15th day of June, 1914.

D. W. Butcher, *Justice of the Peace.*

(My Commission expires Jan. 1, 1915.)

Exhibit 14.

AFFIDAVIT OF FRANK EDINGTON RELATING TO THE PIPE LINE COMPANY'S METHOD OF TAKING OIL FROM THE HEALDTON FIELD.

The State of Oklahoma }
County of Carter }

Frank Edington being duly sworn deposes and says on oath that he was during the period referred to in foregoing affidavit, gauger for the Magnolia Pipe Line Company, gauging the oil produced in the Healdton oil field and purchased by the Pipe Line Company from the various producers.

That he has read the foregoing affidavit and has knowledge of the facts therein referred to, and the same are true and correct.

That this affiant wishes to add to said statement a further statement that his instructions were to pro rate the oil beween the producers fairly and equitably in accordance with the laws of Oklahoma, and that so far as he and the others in charge have been able to do so such instructions have been carried out.

That no intentional discrimination has been shown by this affiant for or against any producer, and so far as affiant knows nobody in charge of said pipe line has shown any such favoritism or practiced any such discrimination.

FRANK EDINGTON.

Sworn to and subscribed before me this 13th day of June, 1914.

E. N. LINEBURG, *Notary Public.*

(My Commission expires April 28, 1918.)
[SEAL.]

EXHIBIT 15.

STATEMENT OF FRANK EDINGTON RELATING TO THE PIPE LINE COMPANY'S METHOD OF TAKING OIL FROM THE HEALDTON FIELD.

(Note by Bureau.—Because of some questions arising as to the manner in which the prorating of the oil in the Healdton field was being carried on, H. L. Chambers, of the Magnolia Pipe Line Co., went to Healdton and investigated the conditions there. The following statement of Frank Edington, taken from Mr. Chambers' report dated April 9, 1914, throws light on the methods in use at that time).

On April 1st we began keeping a book record of the total daily production of what is known as the Healdton Field, in order to enable us to arrive at the prorata part of oil to be run from each lease; that is, the prorata part of the 4,000 barrels which I was instructed by Mr. C. R. Stewart would be all that we would be able to take care of at this time.

For example: on April 1st the total estimated production of the Field amounted to 11,645 barrels, and we were taking 4,000 barrels per day, or 34.3% of the total estimated production. The Humble Oil Co. on the Wirt Franklin lease was estimated at 350 barrels per day, therefore, we would only take from them 120 barrels.

The estimated production is secured from the producers, and which I think is about correct.

The daily estimated production is changed according to increase or decrease every two or three days.

Between March 26th and April 1st, there was no book record kept as to amount to be run from each lease, same was estimated by me and in each and every case I did not run any more oil from one lease than another. My instructions were to run each lease prorata part of the 4,000 barrels, which is the amount we were to take from the total production between the above dates. We do not run the oil from the leases until they have a full tank.

For example: take the Humble Oil Co. on Wirt Franklin lease, the daily amount which they are allowed is 120 barrels at present, therefore, when they have a 250 barrel tank full we make a run from their lease.

The above is a correct statement, and furthermore I have not favored any particular producer.

EXHIBIT 16.

LETTER FROM G. W. JENNINGS TO WIRT FRANKLIN CONCERNING CONDITIONS IN THE HEALDTON FIELD MARCH 20, 1914.

Wirt Franklin, Pres.	A. T. McGhee, Vice Pres.	Edward Galt, Sec.	Roy M. Johnson, Treas.

CRYSTAL OIL COMPANY

Capital Stock $50,000

Directors:
Wirt Franklin
A. T. McGhee
Edward Galt
Roy M. Johnson
S. A. Apple

ARDMORE, OKLAHOMA, 3-20-1914.

Mr. WIRT FRANKLIN, *Pres.*,
Ardmore, Okla.

DEAR SIR: Reporting on the investigation of the pipe lines to the different tanks in the field in the Healdton district. Where the Magnolia Pipe Line Co. have their lines connected to. Our tanks on the Thomas farm in Sec. 5-4-S-3-W are connected with two inch pipe and same runs out 50 feet from the tanks and connects into three inch pipe. Same being a gravity line and it takes from three to four days to get a 1600 bbl. tank of oil in the line.

The Red River Oil Co., west of the Thomas farm have the same connections as we have only they have a small steam pump which is run by gas, size of the pump 7-4½x1.

Paraffine Oil Co., in the Southwest ¼ of the South West ¼ of Sec. 5-4-S-3-W, have their tanks connected with two inch pipe going into three inch pipe, and same being a gravity line.

Red River Oil Company in the N. E. ¼ of Sec. 8-4-S-3-W on the Apple & Franklin farm, tanks are located on the bottom land in the north corner of the farm, tanks are connected up with two inch pipe going into four inch almost at the tanks.

But the Pipe Line Co. today are laying a six inch line up the bottom going south towards the Red River Tanks in Sec. 8.

Humble Oil Co. in the N. W. ¼ of Sec. 9, 4-S-3-W, have the same connections being two and three inch pipe. And being a gravity line.

Watchorn Oil Co. in the S. W. ¼ of Sec. 4.4-S-3W have two and three inch connections and oil goes out by gravity.

Wrightsman & Foster Oil Co. in the N. E. ¼ of Sec. 5.4S-3W, have a battery of three 1600 bbl. tanks connected with two and three inch pipe and oil run by gravity.

Ideal Oil Co. in the S. W. ¼ of Sec. 32, 3S-3W, just north of the Wrightsman & Foster Oil Co. in Sec. 5 have two 1600 bbl. tanks connected with two and three inch pipe, and oil run by gravity. The six inch line runs east and west between Sec. 32 and 5 and the three inch lines connect to the six inch line.

The Ideal and the Wrightsman & Foster Cos. lines to their tanks have check valves on their lines, at the tanks. And all other companies have checks at the tanks.

The Ideal Company has one 1600 tank on the line.

The McMan Oil Co. just west of the Ideal Co. in the same Sec. had a battery of five 250 bbl. tanks for a production of from 1200 bbls to 1500 per day with two tanks on the line being pumped out by the regulation field pump, this oil had to pass by the Ideal Co. on the way to the Station.

None of the tanks on the McMan lease were locked or sealed. All other tanks in the field were and are locked when not on the line.

The 1911 Oil Co. in the same Sec. 32 joining the McMan Oil Co. on the west, same part of the ¼ have a battery of 5–1600 bbl. and 4–250 bbl. tanks with smaller production than the McMan Oil Co. The 1911 Oil Co. have their tanks connected with two and three inch lines running west to the six inch line, this oil runs by gravity and has to pass the McMan tanks on the way to the Station.

The Producers Oil Co. in the S. E. ¼ of the SW. ¼ of Sec. 32, joining the 1911 Oil Co. on the west have two 1600 tanks, one was on the line the stop was open and running by gravity. This oil had to pass by the McMan tanks where the pump was running.

So after seeing what I have today, I think the matter of running our oil needs your attention, see if you cannot get us a pump and we will get out the oil.

Yours very truly,

CRYSTAL OIL CO.,
G. W. JENNINGS, *Supt.*

○

MAR 16 1965

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